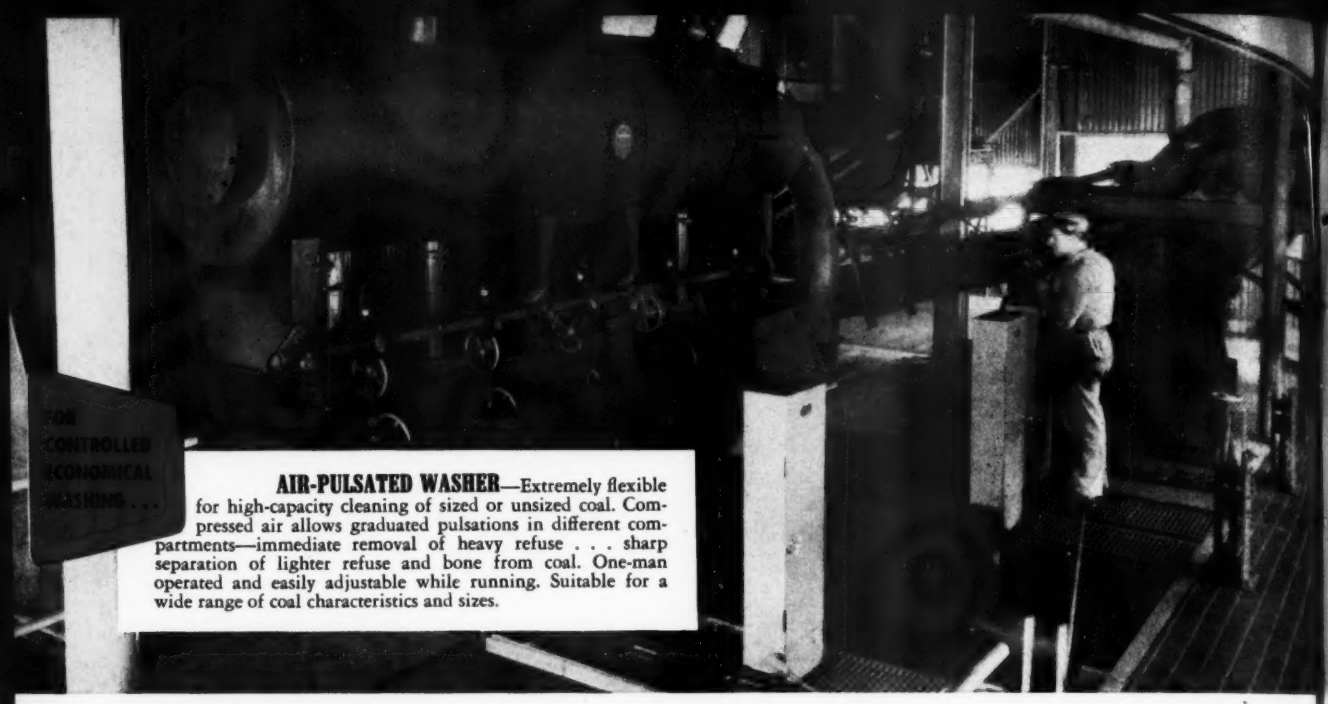
Mining CONGRESS JOURNAL

AMERICAN MINING CONGRESS

APRIL 1951

Cleveland, Ohio —1951 COAL SHOW— *May 14-17*



FOR CONTROLLED ECONOMICAL WASHING . . .

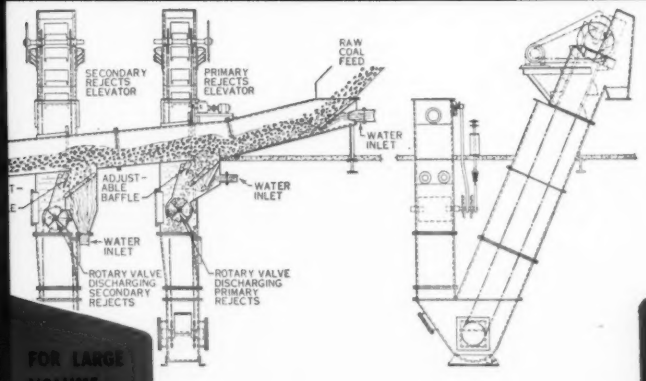
AIR-PULSATED WASHER—Extremely flexible for high-capacity cleaning of sized or unsized coal. Compressed air allows graduated pulsations in different compartments—immediate removal of heavy refuse . . . sharp separation of lighter refuse and bone from coal. One-man operated and easily adjustable while running. Suitable for a wide range of coal characteristics and sizes.

How to wash coal more economically...

Get the right LINK-BELT Coal Washer to match your coal seam and your markets

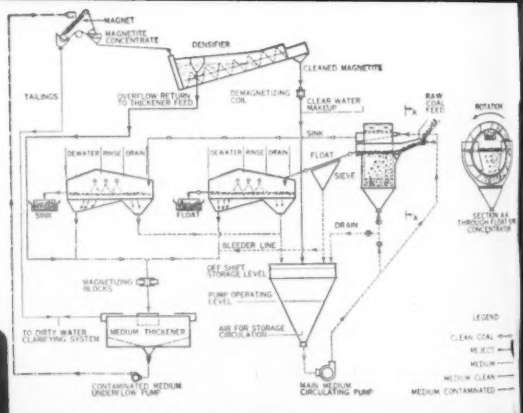
SELLING coal today in an expanding market that's getting more and more demanding requires peak cleaning efficiencies... lower cleaning costs. That's why so many progressive mine operators call on Link-Belt.

For Link-Belt offers three types of coal washers... each designed for a different set of requirements... each tops in its field. Why not have a Link-Belt coal preparation specialist help you and your consultants map out your coal washing plans.



FOR LARGE VOLUME AT LOW COST . . .

TROUGH SEPARATOR—By placing a Link-Belt Trough Separator ahead of the Air-Pulsated Washer, a large additional capacity can be cleaned with little added investment or operating expense. Trough floats off a large part of the coal so clean it requires no further treatment. Remaining coal and middlings then go to air-pulsated jig.



FOR DIFFICULT WASHING JOBS . . .

FLOAT-SINK CONCENTRATOR — Latest advance in coal cleaning — utilizes Heavy-Media* separation process. Efficient for extremely high or low specific gravity separation . . . when a large percentage of coal is near the separation gravity . . . when amount of impurities in feed fluctuates or product must be quickly changed. Cleans larger sizes, reducing necessity for manual picking.

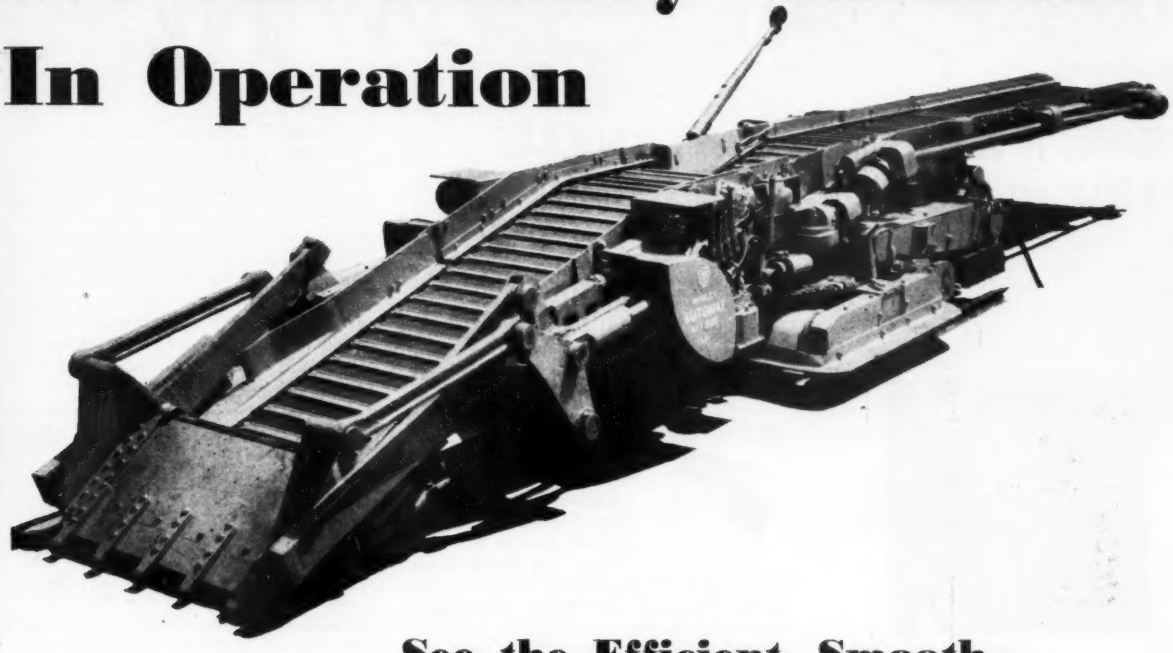
LINK-BELT

COAL PREPARATION and HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Springs (South Africa). 12,297

* The Heavy-Media Separation Processes are licensed by the American Zinc, Lead and Smelting Co. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., are their sole Technical and Sales Representatives for these processes.

See The Whaley "Automat" In Operation



See the Efficient, Smooth Running "Automat" L-S at the 1951 Coal Show . . . Booth 1612

For the first time in several years, we will demonstrate our Low Style "Automat" loading machine at the 1951 Coal Show. This machine will be complete with all improvements of recent years including its automatic lubrication system.

To understand the effectiveness and simplicity of the "Automat" . . . to appreciate its smooth running yet rugged ability for consistent service, you should watch it in service. The next best move is to see it demonstrated at the coal show. To those coal mining men especially who are attending this show for the first time, don't fail to visit our Booth No. 1612. It's your best opportunity to investigate every detail of the "Automat."

Myers-Whaley Co., Knoxville, Tenn.

MYERS-WHALEY

"MECHANICAL LOADERS EXCLUSIVELY FOR OVER 40 YEARS"

R&S COAL SHOW NEWS

"PROMISES TO BE BEST SHOW EVER HELD" says F. E. MUELLER

In a recent interview F. E. Mueller, president of Roberts and Schaefer Company, Chicago, predicted that the 1951 Coal Show will be the biggest and best ever held, from the standpoint of attendance, quality and scope of meetings to

F. E. MUELLER

be presented, as well as from the standpoint of modern methods and machines to be displayed.

Not since World War II, he said, has there been such a challenge to the Coal Industry to increase its productive efficiency and never has any meeting given promise of so many answers to that challenge as the 1951 Coal Show.

COUNTER-CURRENT HEAVY-MEDIA SEPARATOR FEATURE OF R & S EXHIBIT

To be demonstrated at the Roberts & Schaefer exhibit will be a 3′ x 6′ Hardinge Counter-Current Heavy-Media Separator unit. The unit was constructed for use in the new R&S testing plant at Harvey, Illinois, and will be shipped there immediately after the Show. No "toy," this is an actual, operating machine. Though the first one to be used in the bituminous coal industry, it employs principles already proved successful in iron ore separation.

Roberts and Schaefer Company is exclusive licensee for the Hardinge Counter-Current Heavy-Media Separator in the bituminous coal industry.

NEW R & S PREPARATION BULLETINS BEING READIED FOR COAL SHOW

New R&S bulletins, with considerable new information, are being prepared for release at the 1951 Coal Show. In addition to an 8-page bulletin featuring Wet Washing and an 8-page bulletin on Air Washing Large and Small Sizes, there will be a 16-page bulletin, "Preparation Parade," featuring outstanding new preparation plants. Whether you attend the Coal Show or not, you can get a set of these new bulletins as soon as they are off the press by addressing your request to Roberts and Schaefer Co., 130 N. Wells St., Chicago 6, Illinois.

WILLIAM C. McCULLOCH to DISCUSS NEW AIR CLEANING PRACTICES AT SHOW —

As part of a panel on coal preparation problems and solutions at the 1951 Coal Show, Wm. C. McCulloch, R&S Preparation Manager, will discuss current practices in air cleaning of coal.

The following authorities will discuss related subjects as part of the same coal preparation panel: Byron Bird, Jeffrey Manufacturing Co. (Wet Cleaning Fine Coal); David R. Mitchell, Penn State College (Coarse Coal Cleaning); James Hannigan, Glen Alden Coal Co. (Cleaning Small Sizes of Anthracite); and F. P. Calhoun, Rochester & Pittsburgh Coal Co. (Related Problems of Mechanical Coal Cleaning).

D. E. MORGAN

R&S INTERNATIONAL REPRESENTATIVE TO ATTEND CLEVELAND COAL SHOW

David E. Morgan, international representative for Roberts and Schaefer Company, will be at the 1951 Coal Show and available part time to answer questions concerning his recent 7-month tour of coal and metal mines in England, Belgium, France, Tunisia, Morocco and Sardinia. As the R&S contracting engineer, Mr. Morgan recently played a central part in the engineering of a modern preparation plant for the Government of Italy on the island of Sardinia, off the coast of Italy.

R. J. LOFQUIST

RALPH J. LOFQUIST TO ANSWER HYDROGENATION QUESTIONS AT R & S BOOTH

Mining people interested in the preparation of coal for hydrogenation to convert it to gasoline and other liquid fuels will be able to discuss the subject with Ralph J. Lofquist at the R&S booth. As the Roberts and Schaefer contracting engineer for the preparation plant at the Bureau of Mines pilot project at Louisiana, Missouri, Mr. Lofquist is familiar with overall hydrogenation considerations and is especially informed as regards coal preparation requirements. Mr. Lofquist's story of the hydrogenation plant generated considerable interest when published in a leading industry publication as well as when presented in a recent talk before a coal industry group, and it is anticipated that answering questions will keep him busy throughout the length of the show.

KEY PERSONNEL TO STAFF BOOTH

According to present plans, the following R&S executives will staff Booth No. 2000 at the 1951 Coal Show in the Cleveland Auditorium: Frank E. Mueller, J. E. Kalinka, R. T. Middleton, R. E. Sloan, E. C. Carris, W. C. McCulloch, R. G. Miller, R. G. Miller, Jr., R. J. Lofquist, Raymond Wagner, Laning Dress and W. W. Blood. Mr. R. J. Russell, secretary of the Hardinge Company, will also be in attendance. Other personnel may be announced prior to May 14, opening date of the show.

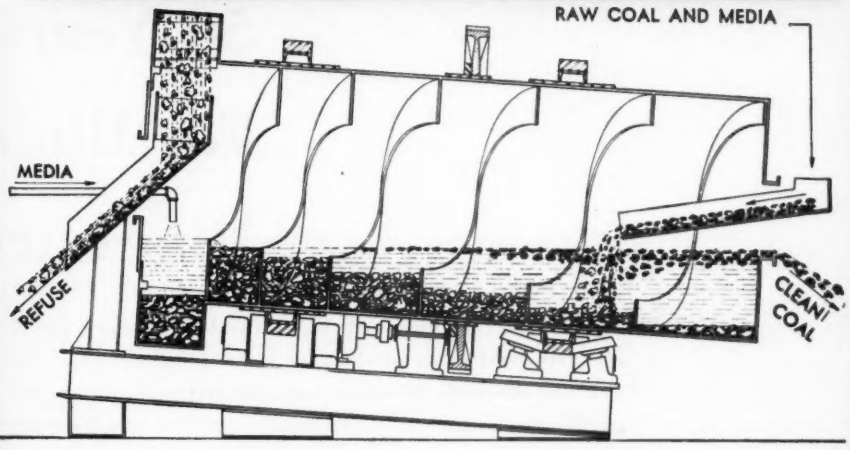
ROBERTS & SCHAEFER COMPANY

BOOTH 2000 AT THE 1951 COAL SHOW

Announcing the appointment of ROBERTS & SCHAEFER Company as exclusive licensees in the Bituminous Coal Industry

FOR THE

HARDINGE COUNTER-CURRENT HEAVY-MEDIA SEPARATOR



The fast, efficient removal of refuse from coal is of paramount importance today. Particularly desirable is equipment that will provide maximum selectivity . . . the hair-line separation of near-gravity coal from near-gravity refuse.

We, therefore, feel that we are extremely fortunate in being able to offer the Hardinge Counter-Current Heavy-Media Separator to the Bituminous Coal Industry. This modern equipment is remarkably efficient and offers important savings in both time and money. It is the result of many years of experience in the design and manufacture of various types of separators and classifiers and embodies many worthwhile advantages. Its operation is exceedingly simple. Separation is precise over a broad gravity range. It will handle large and varying amounts of refuse and provides for wide variations in feed rate. Units are available in sizes and capacities to meet practically any requirements.

You will of course want to know more about the Hardinge equipment so write today for full details and descriptive literature.

The Heavy-Media Separation Processes are licensed by the American Zinc Lead and Smelting Company. American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y., are their sole technical and sales representatives for these processes.

ROBERTS & SCHAEFER Company

130 North Wells Street, Chicago 6, Illinois
1314 Henry W. Oliver Bldg., Pittsburgh 22, Pa.
254 West 54th Street, New York 19, N. Y.
P. O. Box 570, Huntington 10, W. Va.

FOREIGN DEPT.: International Mfg. & Equipment Co., Inc.
220 Broadway, New York 38, New York, U. S. A.

"1951" Sanford-Day's 50th Anniversary

50 Years of Progress For Mining—Building Mine Cars Exclusively

The 1951 Coal Show will mark the half century point for Sanford-Day in serving the mining industry . . . 50 years of devoting its entire capacity to engineering and producing better mine cars to meet every requirement of coal mining.

Our display at the show will be of unusual interest to every coal mining man . . . a display you should not miss!

Today, with a completely modernized and completely retooled plant we are equipped to build more efficient mine cars than ever before. Backed by our staff of experienced engineers we look forward to the next half century secure in the knowledge that we can furnish the best mine cars the industry has ever used.

We cordially invite all members of the coal mining industry to visit us at Booth 1805, see our display, and join us in our 50th Anniversary Celebration!

Sanford-Day Iron Works
KNOXVILLE TENNESSEE

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Advertising
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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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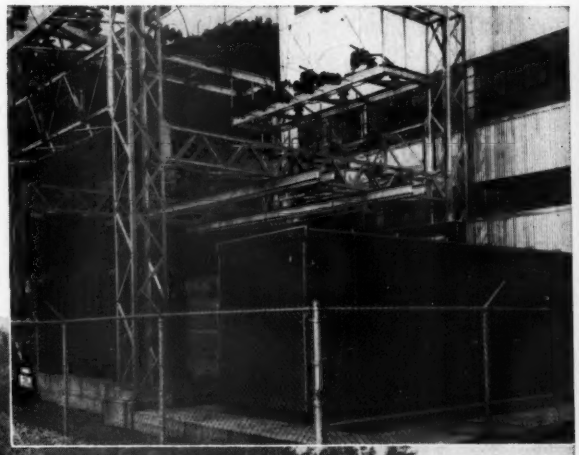
ABC
Member Audit Bureau of Circulations.

Electrically co-ordinated to keep clean-coal output at 750 tons per hour!

New Price mine and preparation plant rely on General Electric equipment to maintain high operating efficiency

Completed in May, 1950, the Price Mine preparation plant of the Inland Steel Co. at Wheelwright, Ky., makes extensive use of co-ordinated General Electric equipment to minimize outage and maintenance delay, keep clean-coal output at rated capacity of 750 tons per hour. Here, ash and other impurities in the mined coal are removed to provide a high grade metallurgical coal, uniformly low in ash, for making coke. A 3000-kva G-E package substation—including transformers and switchgear—contains all equipment needed to step down incoming 44,000-volt power and distribute it at 480 volts to power the plant's motors.



GENERAL ELECTRIC

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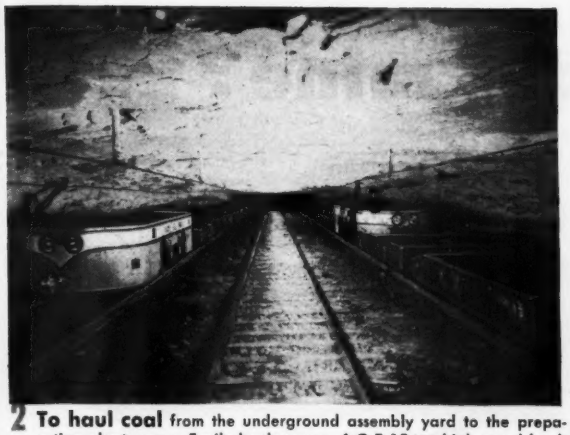
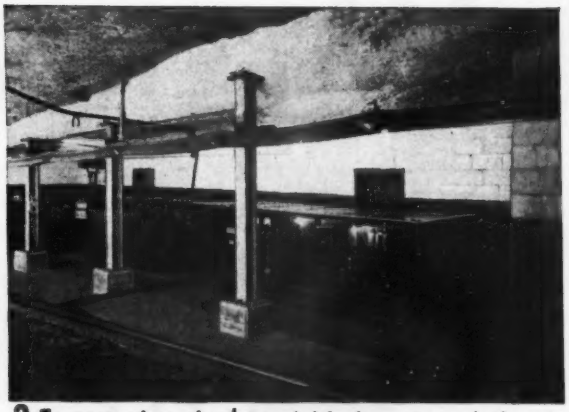
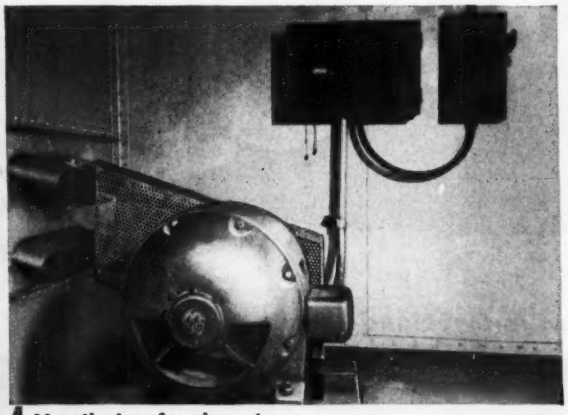


2 To haul coal from the underground assembly yard to the preparation plant over a 5-mile haulageway, 6 G-E 15-ton high-speed haulage locomotives are used, fully equipped with air brakes and air sanding, and controlled by air-operated contactors. Efficient, powerful, fast and safe, each locomotive makes 5 to 6 round trips per 7½-hour shift, handles 60 cars, each of 4¾ tons total gross weight.

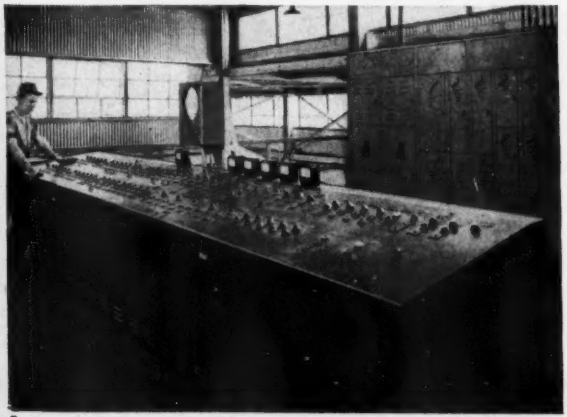


3 To convert a-c to d-c needed for locomotives and other mining machinery, two G-E 300-kw 275-volt d-c rectifiers are used, one stationary and one portable. High in conversion efficiency, these units are easily installed, give high service continuity with minimum maintenance, and are metal-enclosed to protect personnel. Portable type shown is easily relocated to give near-full voltage at the face for more efficient machine operation, and to eliminate long, expensive d-c cable runs.



4 Ventilation for the mine is supplied by a 4-foot high-speed fan driven by this G-E 2-speed Tri-Clad* motor rated 50/12½ hp, 1175/585 rpm, 440 volts. Tri-Clad motors—with 3-way extra protection built in against physical damage, electrical breakdown, and operating wear and tear—are available in enclosures for every mining use. G-E automatic 2-speed control above motor protects fan against single-phase operation, overload, and other possible interruptions to this vital operation.

5 From the washers, after cleaning, ¼" x 0 coal is fed into 6 centrifugal dryers (four shown) driven by G-E wound-rotor motors rated 150 hp, 900 rpm, 440 volts. Plant uses a total of about 3600 horsepower. And with dependable G-E motors and control co-ordinated into a smooth-running, efficient, and low-maintenance operation, each step in the preparation process dovetails with all other steps, minimizing production slowdowns, maintaining high service continuity.



6 Centralized control of plant operations is provided by this G-E main control desk. Push buttons, selector switches and indicating lights are all conveniently combined and centralized at one location, to co-ordinate operations closely, make most efficient use of manpower. G-E Cabinetrol* unit in background, one of several located at control points, contains switch and fuse combination starters, plus interlocks and timers to provide sequence operation.

*Registered trade mark of General Electric Co.

7 All G-E equipment for this mine was supplied on a G-E project co-ordination basis. Find out how this plan can simplify your ordering, save your time, help your consulting engineers and contractors to provide a co-ordinated system to meet your needs. Ask your G-E representative to tell you all about this plan, and send for Bulletin GEA-5308, a 32-page photo report on how G-E is benefiting typical preparation plants. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

Which for your mine?

AIRDOX

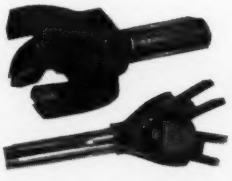
See Our Exhibit at the Coal Show in Cleveland—Booths 2338 to 2350

COAL RECOVERY DRILL

Designed to salvage profitable tonnage where overburden removal has become too costly for further stripping. Cardox-Hardsocg Augers, available in diameters of 20" to 40", carry the coal in a continuous flow from the seam. Illustration above shows "hook-up" with portable conveyor for automatically loading trucks or cars.

CARDOX-HARDSOCG

Standard Drilling Equipment



The Cardox-Hardsocg line of proven drilling equipment features Carbide Tipped and Standard Cutterheads, augers ranging from 2" to 8" in diameter, bits, wedges, thread-bars, sockets, boxing and boxing liners.

Cardox-Hardsocg Carbide Tipped Cutterheads are available with recessed core breaker as shown, or extended pilot, and with spline, square or hexagon connections.

Write for descriptive bulletins of operating details and ASK FOR a free survey by a Cardox Corporation engineer.

CARDOX CORPORATIO

BELL BUILDING • CHICAGO 1, ILLINO

CARDOX

One of these methods will cut your operating costs!

[redacted]—brings to any coal mine a powerful new force [redacted]harp hammer-blow of explosives. This gentle [redacted] improve your operation whether you get it [redacted] or *Airdox*—but which of these is best suited to the [redacted]tions of a given mine is a technical decision for our engineers in conference with yours.

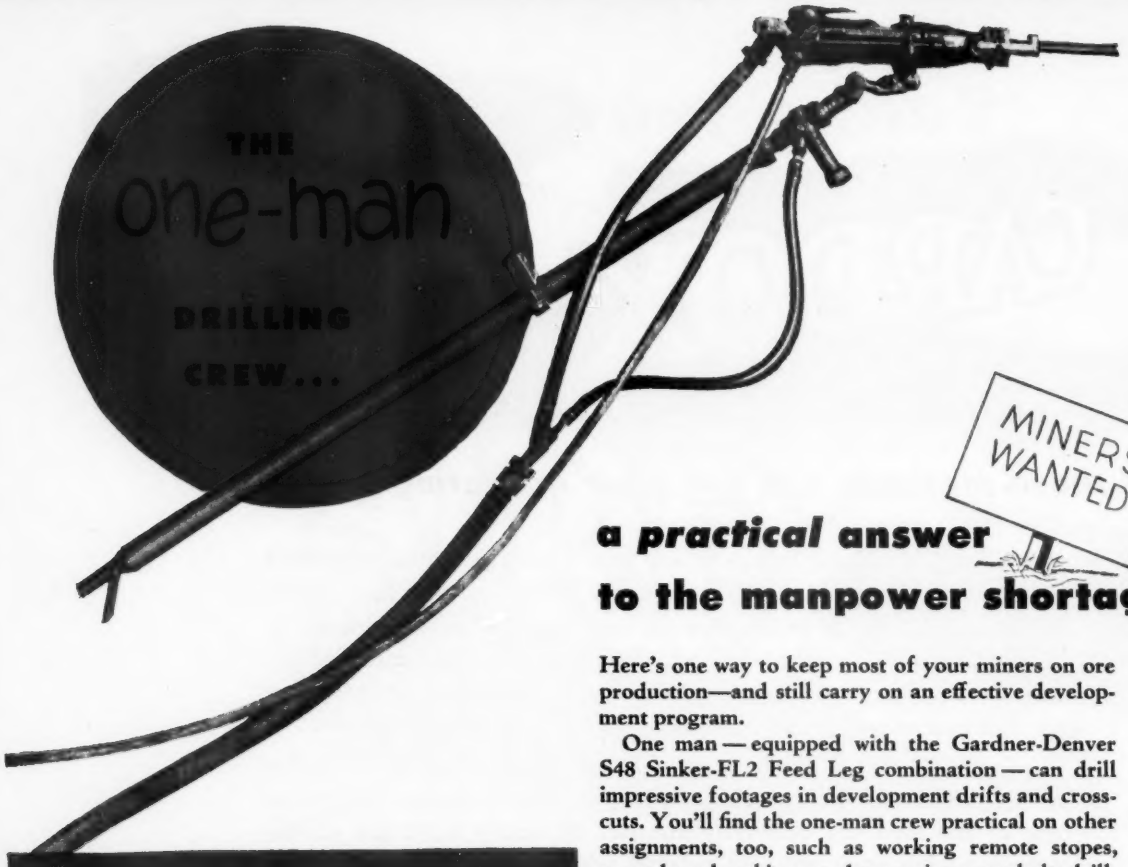
Airdox is a special application of compressed air power. *Cardox* employs the great force of expanding carbon dioxide. Methods of use at the face are generally similar. Naturally both are widely accepted for their greater safety* which permits on-shift use.

**Among the hazards eliminated by Cardox Non-Explosive Mining Methods is detonator caps found in coal after delivery to plants. Frequently cases of this kind are reported in the news—one specifically where a series of fires in coal pulverizer units resulted from this cause.*

Both AIRDOX and CARDOX give you

The comparatively gentle heaving action results in more premium size coal in every ton mined and freedom from shatter cracks that cause costly degradation. That means more salable coal that is EASIER to sell.

Either method dislodges coal with a piston-like action concentrated at the *back* of the drill hole, where it is most effective. No smoke, flame or fumes accompany the fall—and very little dust.



a *practical* answer to the manpower shortage

Here's one way to keep most of your miners on ore production—and still carry on an effective development program.

One man — equipped with the Gardner-Denver S48 Sinker-FL2 Feed Leg combination — can drill impressive footages in development drifts and crosscuts. You'll find the one-man crew practical on other assignments, too, such as working remote stopes, secondary breaking at draw points, eye-bolt drilling, etc.

This lightweight Gardner-Denver combination is specially designed for fast drilling with tungsten-carbide tipped rods and detachable bits. It consists of the new 45-pound S48 Sinker—the equal of most 55-pound drills in speed and power—mounted on the lightweight, long-travel FL2 Air Feed Leg.

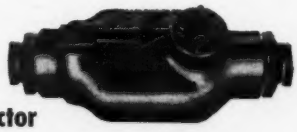
Write us today for complete information.

for more footage per man-hour
... always choose
GARDNER-DENVER SINKERS

Heavy-duty shaft-sinking models also available.

℞

from the drill doctor



Drills lubricated by the L012 Automatic Line Oiler *can't* run dry—never show symptoms of inadequate lubrication.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada:
Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

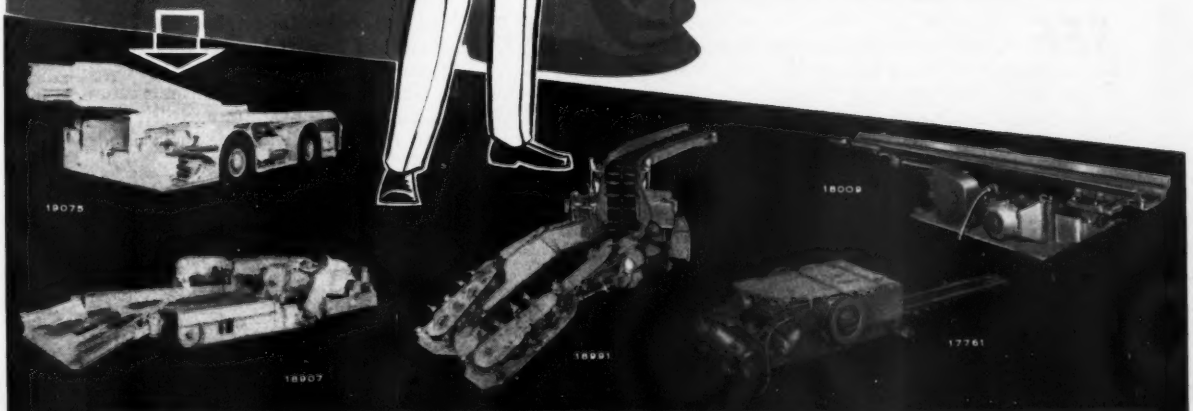
THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

At the 1951 COAL SHOW
CLEVELAND
ALL EYES WILL BE ON THE *Goodman* EXHIBIT!

See These New Machines Never Before Exhibited!

- Goodman Combination Cutting and Loading Machine
- Goodman "Low Vein" Tractor Tread Loader
- Goodman Swing Motion Trough for Duckbill Loader
- Goodman Duckling

Also on display: Type 605 Tractor Tread Loader; Type 530 (42") Shuttle Car with hydraulic control of elevating discharge; the widely used Type 512 Shortwall with Bugduster; a general duty Tractor Tread Truck; Types E-11 and L-20 Shaker Drives; tail section of a Type 99 Belt Conveyor; a selection of renewal parts, including a Bugduster unit for the Goodman Type 12 Shortwall.

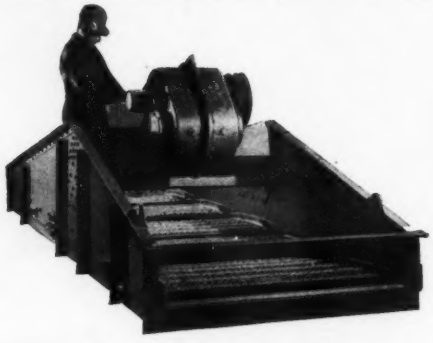


Goodman MANUFACTURING COMPANY

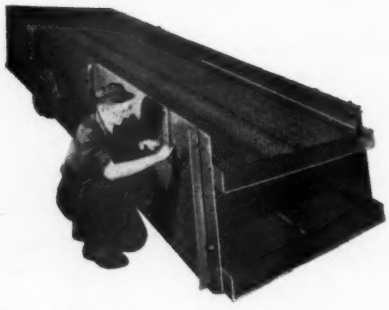
HALSTED STREET at 48th • CHICAGO 9, ILLINOIS

CUTTING MACHINES • CONVEYORS • LOADERS • SHUTTLE CARS • LOCOMOTIVES

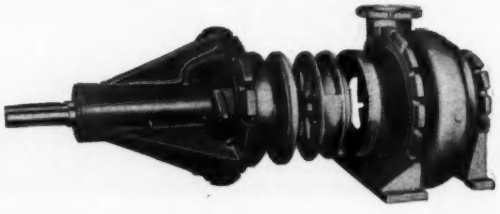
Allis-Chalmers Products You'll Want to See at the Coal Show



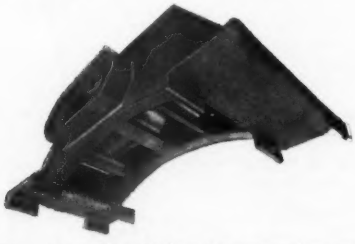
SEE A full-size 6 by 16 ft single deck *Low-Head* vibrating screen with reverse end-tension deck . . . the coal screen designed for high dewatering efficiency. Allis-Chalmers deck arrangement turns fine coal over repeatedly, assuring free drainage and eliminating a closely packed bed with fines on bottom and coarse coal on top.



SEE 5 by 12 ft *Ripl-Flo* vibrating screen — the screen that gives you high capacity for sizing egg, range, stoker grades. Available in heavy-duty construction for screening ROM coal in sizes up to 22 in. Has only two bearings — less weight, maintenance, power requirements. Sizes 3 by 6 to 6 by 16 ft.



SEE The *CW Solids-Handling* pump — designed by Allis-Chalmers especially for coal washing! CW pump has only five working parts which can be removed easily. Handles slurries, tailings, sludges having up to 40% solids in suspension. *Allisite* parts give high abrasion resistance. 175 to 10,000 gpm; heads to 150 ft.



SEE *New* Car-Shaker for emptying coal from all sizes of hopper bottom cars quickly and safely. Shaker body is "stress-relieved" for uniform strength. Simple vibrating mechanism is eccentric shaft mounted on large bearings and driven by 15 hp motor and *Texrope* drive inside shaker body.

OTHER ALLIS-CHALMERS PRODUCTS FOR COAL — *Texrope* V-belt drives . . . Electric Motors and Gearmotors . . . Multi-stage Mine Pumps . . . Rubber-lined Pumps . . . Transformers . . . Mobile Unit Substations . . . Complete line of Power Generation, Distribution and Control Equipment.

A-3383

ALLIS-CHALMERS

Low-Head, Ripl-Flo, Texrope and Allisite are Allis-Chalmers trademarks.

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Motors

Controls

Texrope Drives

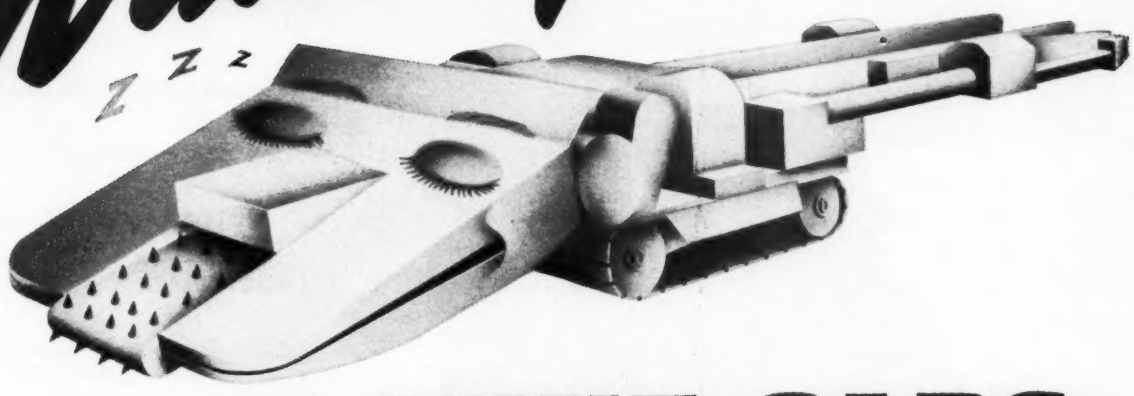
Vibrating Screens

Centrifugal Pumps

Transformers

NO LOADING MACHINE

Waiting...



...with MINE CARS

Just look at the one big difference between mine cars and a 'continuous' haulage system: *the time-out costs.* Repairs on mine cars are few, far between, and mostly quite inexpensive. Even more important—one car 'out' *doesn't stop your coal from moving!* If a car needs adjustment . . . onto a siding with it! Your loaders fill up the rest of the trip. Your men—all the way from the face to the tipple—keep normally busy. Your coal gets out *all* day . . . every day . . . when you use a complete mine car system. You *keep* the loading machines busy!

American Car and Foundry Co., New York • Chicago • St. Louis • San Francisco • Washington • Philadelphia • Cleveland • Pittsburgh • Huntington, W. Va. • Berwick, Pa.

a.c.f.

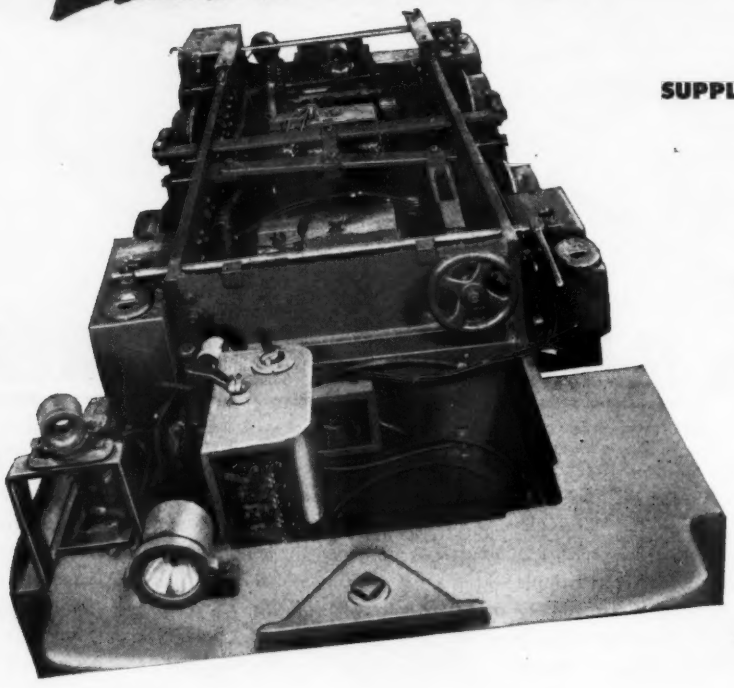
DROP BOTTOM

MINE CARS

for Constant Haulage

Visit
Booth 1523
at the
COAL SHOW
CLEVELAND
MAY 14 - 17

Whatever your Mine Locomotives need to keep them in good running condition NATIONAL ELECTRIC COIL CAN DO!



COMPLETE REBUILDING

SUPPLYING REPLACEMENT COILS

MOTOR OVERHAULING

CONTROLLER REPAIRING

MECHANICALLY DAMAGED MOTOR REPAIRING

SPLIT FRAME MOTORS MADE INTO SOLID FRAME MOTORS

TIRE RETREADING

A LOCOMOTIVE BEING COMPLETELY REBUILT IN OUR BLUEFIELD PLANT

The National Electric Coil Company was born in the coal mining field. Our first plant, in Bluefield, West Virginia, and our new plant in Harlan, Kentucky, are equipped and manned primarily for service to the mining industry. Key people are "graduates" of work in the mines. Either plant can handle any mine locomotive job, from continuous-weld tire tread rebuilding to complete locomotive rebuilding. Overflow coil and motor work from either plant is done in our Columbus, Ohio plant.

Locomotives can be delivered to us via our truck or yours, or by flat car. Motors can be rewound in your shop or ours. And National electrical work is done with a full knowledge of the rugged life of electrical apparatus in mining.

If you don't know the National field engineer near you, drop us a line. He knows your problems; he's there to help you.

NATIONAL ELECTRIC COIL COMPANY

COLUMBUS 16, OHIO, U. S. A.

What's YOUR problem?

Fred A. Barnes is the lubrication specialist who advised this midwest mine to use STANOIL in its speed reducers to safeguard gear teeth. With headquarters in Standard Oil's Decatur office, he was able to give prompt attention to the problem posed by the mine operators.

There's a Standard Oil lubrication specialist located near your mine. He's one of a corps of highly trained, experienced men throughout the midwest, and he's ready to help you make significant savings.

Arrange now for the visit of the lubrication specialist serving your area. Just phone or address a card to the nearest Standard Oil Company (Indiana) office. Ask him to explain the advantages of these other Standard petroleum products:

SUPERLA Mine Lubricants—These new, improved oils and greases provide better lubrication of cutters, loaders, locomotives, mine cars, and other underground equipment. They eliminate transmission-case deposits, reduce clutch-plate gumming, and minimize wear on gears and bearings.

CALUMET Viscous Lubricants—On open gears and wire rope, these greases resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

SUPERLA Greases—Available in lime soap and soda types, SUPERLA Greases cover a wide range of applications. These products are comparable in quality to the highest type of special greases but are as readily available and economical as ordinary cup greases.

Keeps speed reducers geared to greater tonnage . . .

A MIDWEST SURFACE MINE has processed an average of some 4,000 tons of coal per day in its large preparation plant. The continuous high output of this plant has been largely a result of decisions made two years ago by officials of this mine.

At that time, the preparation plant was put into operation. One of the decisions made by the mine operators was based on the recommendation of a Standard Oil lubrication specialist. The operators gave STANOIL Industrial Oil the important job of lubricating gear reduction units used in driving the processing equipment.

In the two years of operation, no cleaning of the reduction units has been necessary. Although changed each year as a matter of routine, STANOIL has shown no deterioration in service. Gear teeth have remained in excellent condition. Moreover, plant operators report that with the use of STANOIL there have been no heavy starting loads due to the oil's thickening at low temperatures.

STANOIL
TRADE MARK
Industrial Oil

You can simplify your mine lubrication jobs by using STANOIL Industrial Oil. It provides cleaner operation of loader and crane hydraulic units, supplies effective lubrication in compressors, gear cases, and circulating systems.

To assure you of maximum benefits from STANOIL and other high-quality petroleum products, the Standard Oil Company has a well-trained and experienced lubrication specialist near your plant. To obtain his prompt and expert services phone your local Standard Oil Company (Indiana) office, or write to: Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD

You'll want to see the new Euclid twin-powered scraper and other "Eucs" for coal, overburden and gob hauling that will be on display at the Coal Show.

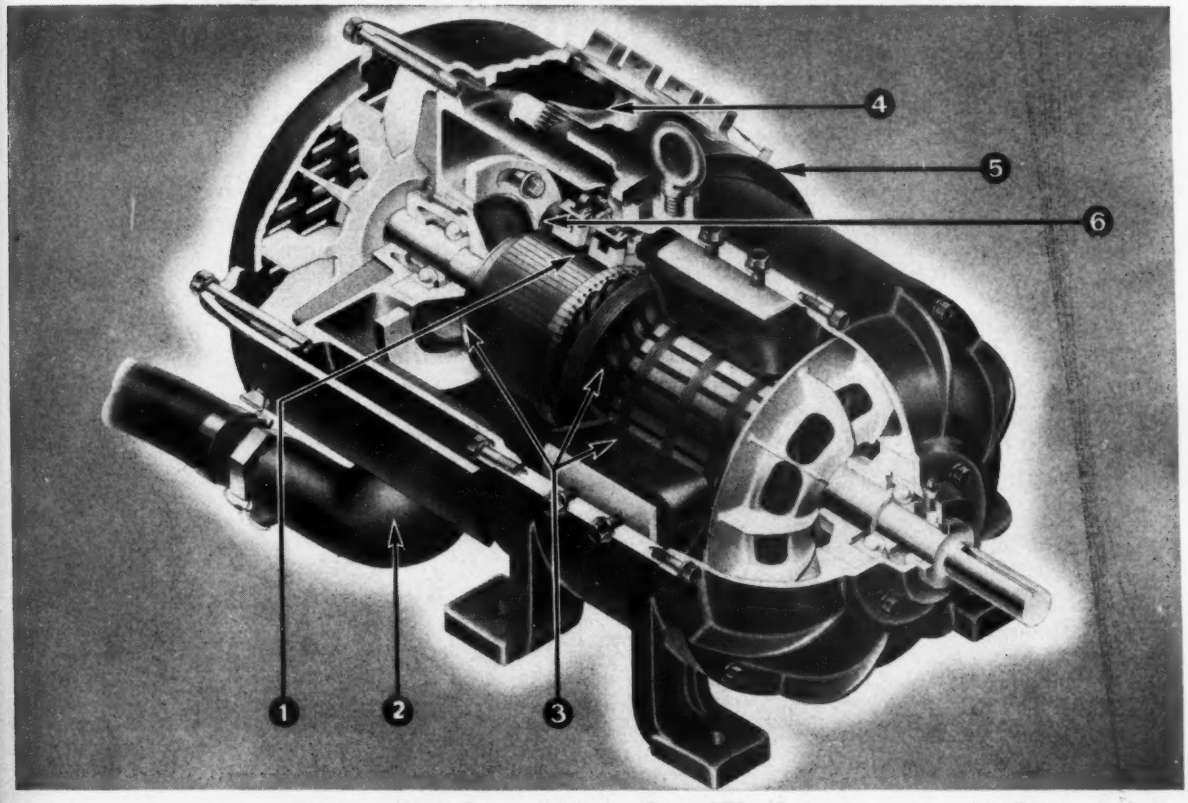
And while you are in Cleveland we hope that you'll give us an opportunity to show you the modern new factory where Euclid equipment is built. Just drop in at our exhibit and we'll arrange a plant trip at your convenience.

We are looking forward to seeing you in Cleveland and hope you'll put Euclid Headquarters on your "must" list for the Coal Show.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

ANNOUNCING

completely New G-E MINE MOTOR —designed for easier maintenance!



Completely NEW!

DC mine Motors

Explosion-proof, listed by U.S. Bureau of Mines, for any underground mining use

Here's the completely new General Electric d-c mine motor—with all the convenience features operators and mining-machinery manufacturers told us were wanted most! And here are just six out of 21 reasons why it's so *much* easier to inspect and maintain, longer-lasting, easier to install:

1. **New two-stud brush construction** permits locating all brushes on only one half of commutator, eliminating need for access from four sides. Brushes are located on upper half unless otherwise requested. Brushes are easily accessible through two large hand holes located directly above brushes.

2. **Removable cable gland,** plus generous-length internal leads with convenient terminals, make it easy to replace cable right in the mine, without dismantling motor. Gland does not project beyond diameter of the motor.

3. **Moisture-resisting insulation** minimizes effects of moisture absorption which frequently causes mine-motor insulation failures.

4. **Special hand-hole cover design** lets ventilating air wipe entire surface of frame and end shield, assures adequate cooling. Screw-in-type cast bronze cover with sturdy lugs needs no special tools for removal.

5. **Sturdy fan housing,** of shock resistant cast-iron, is easily removed to clean air chamber. Machined fits assure its accurate alignment and rigid mounting.

6. **Brush-holder stud insulation** is made of mycalex, a glass-bonded, inorganic, non-tracking mica. Steel brush holder yoke will not chip or crack.

New booklet tells whole story! *All* the many advantages of this new, easier-to-maintain G-E mine motor—in ratings from ½ to 60 hp—are described in Bulletin GEA-5553, just off the press. Ask your G-E representative for *your* copy *today*, or write Dept. 663-15, *General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

663-15

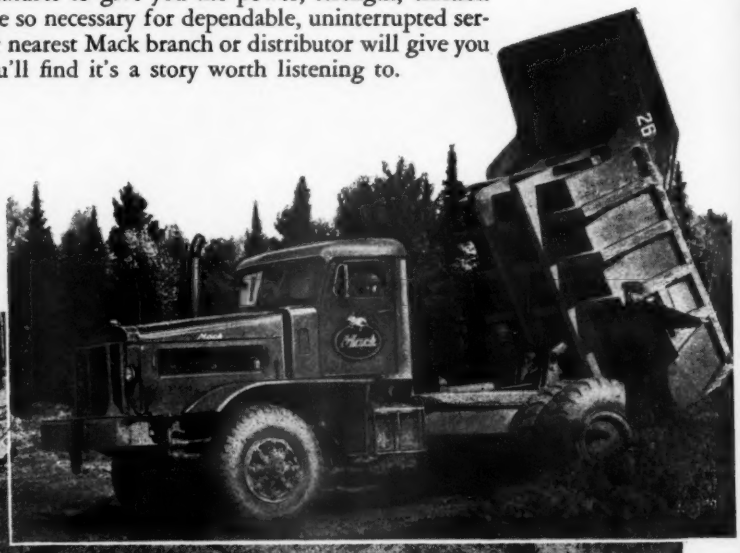
Macks ARE Masters

OF THE TOUGHEST TERRAIN

No matter how tough the going... under the worst of weather conditions... through slippery mire or shifting sand... or over rutted, uneven ground — big SUPER MACK trucks keep the payloads moving on time... at less cost and with less absenteeism.

One big reason why Mack trucks lick the toughest terrain is the exclusive Mack Power Divider. Where unequal tractive requirements are encountered, the Power Divider differential distributes torque to favor the driving wheel having the most traction, thus eliminating power dissipation in useless wheel slippage.

Mack's exclusive Power Divider combines with numerous other outstanding Mack features to give you the power, strength, traction and easy maintenance so necessary for dependable, uninterrupted service on the job. Your nearest Mack branch or distributor will give you complete details. You'll find it's a story worth listening to.



Whether in stripping or excavating, Model LR SUPER MACK trucks keep the loads moving—fast.

Mack TRUCKS ... *outlast them all*

Mack Trucks, Empire State Bldg., New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Mine Official Reports 37.5% Lower Bit Cost

Officials in an Armstrong Co., Pa. mine report that Kennametal Mining Machine Bits result in 37.5% more cutting per bit life as compared to other carbide bits that have been used. Total tonnage: with other carbide—3,126 tons, with Kennametal—4,994 tons. Service between bit changes was increased from 9 places to 14 places. Bit life was 37.5% longer.

●

Matthews, Moore Coal Co., Gets Answer to Power Problem

Results of power test made for Mr. Claude Matthews, Supt., Moore Coal Co., Devonia, Tenn., show that Kennametal U-5-H Bits require 29% less power than steel bits. Test was made by a West Virginia consulting company. Particulars are: The machine using steel bits averaged a load of 52 H.P. on the motor while Kennametal averaged 37 H.P. or 29% lower average power. The machine which was rated at 50 H.P. operated at a 2 H.P. overload when steel bits were in service.

●

Bit Cost Reduced to .58 cents per ton, Clymer No. 2 Mine, Clearfield Bituminous Coal Corp.

J. F. Simpson, Mine Superintendent, says, "We have used Kennametal Bits for three years and they have cut 284 places per set." Prior to the use of U-7 Bits at the mine, complete bit changes or resettings were made on each place that was cut. Bit cost averages only .58 of one cent per ton.

●

Booklet on Mining Bits Available for the Asking

New styles, sizes, prices and performance data on Kennametal Bits are available in new Mining Catalog M-6 published by Kennametal. You can have a copy by writing us and asking for it.

Duquesne Light Co.'s Harwick Mine

Reduces Cutting Cost

with Kennametal Bits

James H. Truax, mine superintendent, says, "We checked the performance of 100 Kennametal U-4 Bits and found that they gave a bit cost of $.0026 per ton, which we consider very good." The cutting was done in a section of the mine where the coal was only medium hard to cut, and in other sections where it was more difficult, the U-7 was put on test. The record there, according to James Truax, was also satisfactory. He says, "The U-7 Bits have helped to make a difficult cutting job easier and more profitable." In this cutting, 14 places were cut between bit changes and 50 places were cut per set of bits.

Beside lowering bit cost, other advantages that are obtained by using Kennametal Bits are more efficient cutting because fewer stops are made to change or set bits, a large saving is also made on machine repair because the bits stay sharp and allow it to cut freer, and due to less changing and fewer dull bits, the cost of bit reconditioning is greatly reduced.

One of our service representatives who deals only in cutting and drilling problems will be glad to explain how Kennametal Bits can be cost-savers for you. Kennametal Inc., Latrobe, Pa.

The name of your nearest Kennametal representative can be found in your McGraw-Hill Mining Catalog. Contact him today.

KENNAMETAL®

DRILL BITS • MACHINE BITS • ROCK BITS • ROOF BITS

Bits for Every Cutting & Drilling Need

NELDCO

AT THE

1951

COAL SHOW

Be sure to visit
BOOTHS 2565, 2569 and 2669
and see the latest in
ENGINEERING and DESIGN in

HEAVY MEDIA
(FLOAT AND SINK)
COAL CLEANING PLANTS

Our staff of experienced coal preparation engineers will be glad to discuss your coal preparation problems and explain the many advantages of the NELDCO Heavy Media Precision Coal Cleaning System which can be adapted to small as well as large production mines.

NELSON L. DAVIS COMPANY

343 SO. DEARBORN ST. ● CHICAGO 4, ILLINOIS

DESIGNERS AND BUILDERS OF COAL CLEANING PLANTS
USING THE HEAVY MEDIA PROCESS

triple play for profit

with P&H ELECTRIC SHOVELS

All three of these P&H Electric Shovels are at work for J. Robert Bazely at Pottsville, Pa. There are three sizes at work here — 4, 5 and 6 cu. yds., all delivering steadily at rock bottom costs.

P&H leads the field in Electric Shovel Developments.

It's the same pattern wherever these new P&H Electric Shovels go to work: The first machine sells the second — the third — and more.

The reasons are plain and simple — *better performance — bigger production — lower tonnage cost.*

Reasons behind the reasons are such advantages as P&H Magnetorque* which powers hoisting motions electro-magnetically — smoother, faster, more dependably . . . rugged all-welded construction with more strength to withstand shock loads . . . independent propel for quicker move-ups . . . stepless control which eliminates all contactor troubles . . . filtered air cab ventilation for less electrical down time.

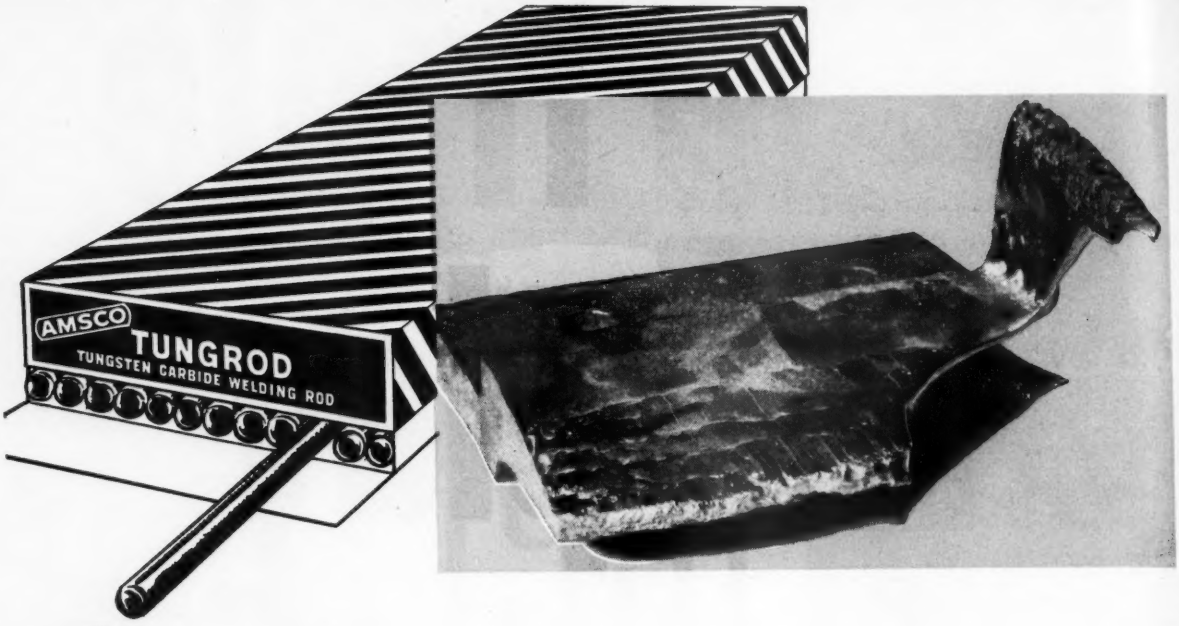
The cold, hard facts that count are: *performance, production, low tonnage cost.* Figure your costs with P&H Electric Shovels and you'll find a convincing difference. It explains why every third P&H Electric Shovel sold is a repeat order.

*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

P&H ELECTRIC SHOVELS
4555 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

Every third P&H Electric Shovel sold is a repeat order

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • PRE-ASSEMBLED HOMES



Saved HUNDREDS OF DOLLARS PER MONTH IN PULVERIZING!

An example of how the AMSCO Hardfacing System can help you fight wear profitably

Here's why the AMSCO HARDFACING SYSTEM can save you money

Hardfacing recommendations are as sound as the manufacturer who makes them. For a half-century, Amsco has specialized in fighting the high cost of wear—first with manganese steel and later with another big weapon . . . AMSCO Hardfacing Rods and Electrodes.

The result is the AMSCO Hardfacing System . . . where a wide range of Amsco Rods are selected for use according to a systematic appraisal of the equipment part and wear factors involved.

Whether your particular problem is one of wear caused by impact, abrasion, heat, corrosion—alone or in combination . . .

Amsco has both the research facilities and the years of on-the-job experience necessary to help you make important reductions in your operating costs.

A large Pennsylvania brick company was faced with this problem: their pulverizer plows wore out every two weeks due to extreme abrasion of clay with a high silica content. An expensive period of down-time and replacement labor resulted.

In trying to stop this high replacement cost, a test was made. Each plow was hardfaced with AMSCO Tungrod—specially developed by Amsco research for high resistance to abrasive wear.

Result? The plows hardfaced with AMSCO Tungrod lasted 4 times as long . . . 3 out of every four replacement jobs were eliminated! The saving amounted to several hundred dollars *each month!*

AMSCO Tungrod permits big savings—through longer service and fewer replacements—on many other applications. If you have an equipment part used in cutting or pulverizing non-metallic materials, the possible savings—*to you*—are too big to be overlooked!

Write today for illustrated hardfacing catalog — and nearest distributor's name.

AMSCO®
WELDING PRODUCTS

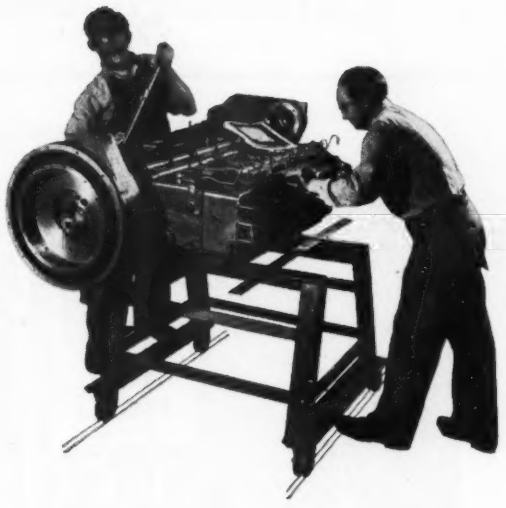
AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
422 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver Oakland, Cal., Los Angeles, St. Louis In Canada: Joliette Steel Division, Joliette, Que

Cummins® Custom-built Diesels

Built not once but Twice



Extra care in building means extra profits for power users

Typical of the extra care that goes into the building of *every* rugged, dependable Diesel is the tear-down of the engine after assembly. First the engine is run in on the test block. Then it is completely torn down and carefully re-inspected. After that it is re-assembled and tested *again*.

Such *extra* care in precision craftsmanship is one of the reasons why Cummins engines have such an outstanding record in a wide range of applications. Cummins exclusive fuel system ... world-wide service and parts supply organization ... are other features that enable power users to make more profit with Cummins Diesels.

There's a model engineered to fit your power needs. Contact your Cummins dealer. He has more facts to show you.

CUMMINS Dependable DIESEL

Diesel power by CUMMINS

TRADEMARK REG. U. S. PAT. OFF.

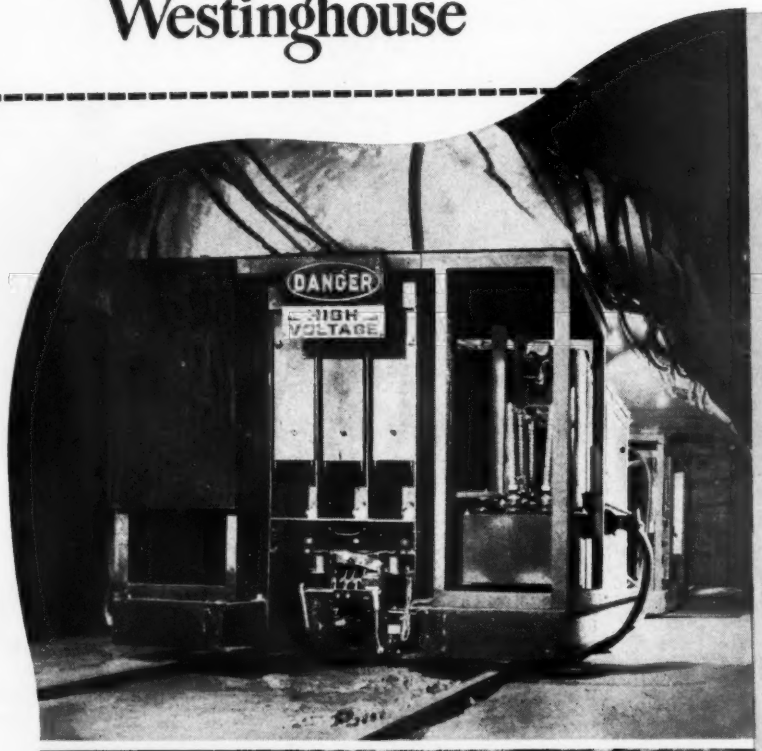
CUMMINS ENGINE COMPANY, INC. • COLUMBUS, IND.

EXPORT: CUMMINS DIESEL EXPORT CORPORATION
Columbus, Indiana, U. S. A. • Cable: Cumdiex

Lightweight High-speed Diesel Engines (50-550 hp) for: On-highway trucks • off-highway trucks • buses • tractors • earth-movers • shovels • cranes • industrial locomotives • air compressors logging yarders and loaders • drilling rigs • centrifugal pumps generator sets and power units • work boats and pleasure craft.

YOU CAN BE **SURE**.. IF IT'S

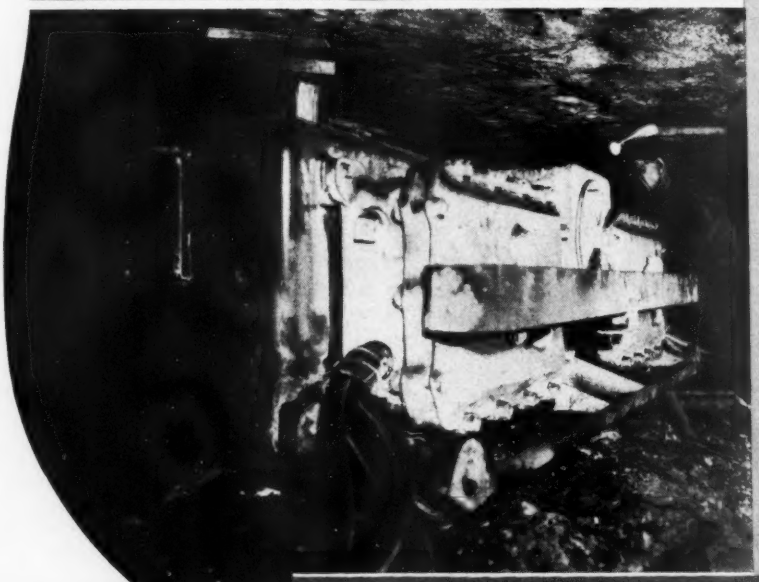
Westinghouse



FOR D-C OPERATIONS...

Ignitrons provide most economical power

Westinghouse-developed Ignitron Rectifier Substations offer outstanding advantages of portability, efficiency and low maintenance for main power supply in d-c mines. Mounted in three, low mine cars, they're readily portable so that power supply can be kept close to the work. (Stationary units are also available for surface operations.) High Ignitron efficiency saves about $5,000 per year in power costs alone in a typical 3000-kw operation. Maintenance is ⅔ that of M-G set. For more information write for B-4658.



FOR A-C OPERATIONS...

The safest transformer ever built

Here's the obvious answer to a-c mine power supply—the only Power Center actually designed for underground coal mining service. Skid it right up to the face, connect it and forget it. The Westinghouse Mine Power Center contains nitrogen-cooled transformer *with fireproof insulation* and feeder breakers in a compact, lightweight, easy-to-move unit only 25″ high. There are no liquids to maintain. It is *completely explosion-proof,* and needs no special ventilation. Write for C.S. 48-580.

Westinghouse

EQUIPMENT FOR THE MINING INDUSTRY

Is poor power supply wasting your money?

Efficient Mining Demands Adequate Power Where You Need It

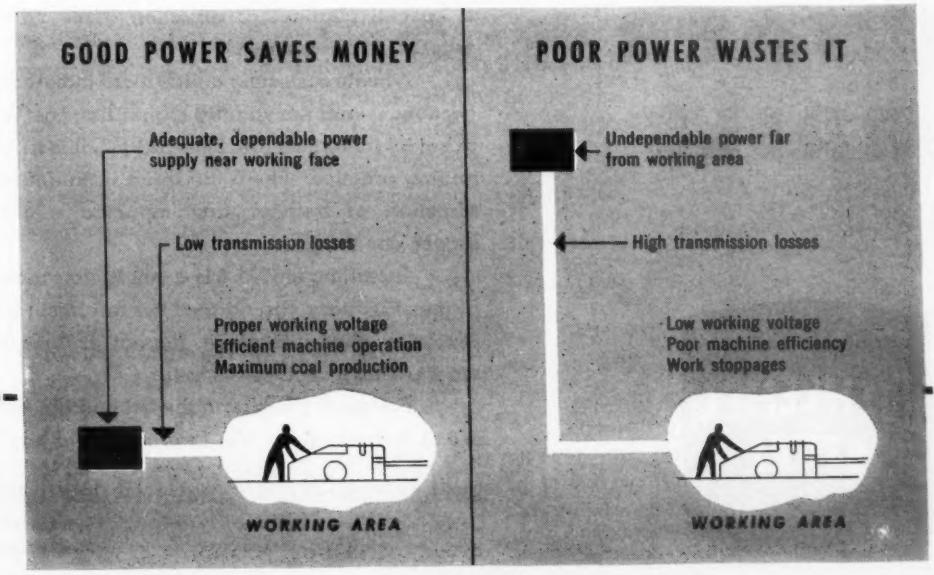
Here's how to avoid the costly consequences of power supply that's inadequate, undependable, or too far from the working face. With Westinghouse *mine-designed* Power Centers and Substations you do away with high transmission losses, low-working voltage, poor machine efficiency, overheated motors, work stoppages, high maintenance costs.

ANSWERS: WESTINGHOUSE MINE POWER CENTER, IGNITRON SUBSTATION

Westinghouse Ignitron Rectifier Substations for d-c mines and Mine Power Centers for a-c operations give you the power you need. Their operation is dependable and automatic. They're available in a wide range of ratings to deliver the volume of power needed. And most important, both are readily portable—compact, lightweight, easy to install and connect—so that power supply can be kept near the working face. This is essential. For example, by moving its power supply one mile closer to the working face, one new mine boosted production 23%—*with no increase in men or equipment.*

CHECK YOUR OPERATION; LET WESTINGHOUSE HELP

Make sure you're not wasting money that a good power supply would save. Study your operation. Westinghouse Mine Specialists will be glad to help—with no obligation, of course. Just call your nearby Westinghouse office. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94847



PUT STRENGTH UNDER RAILS

Bethlehem's No. 5 Steel Tie is a husky, rugged brute that is built to carry the crushing loads of today's mechanized equipment—the massive cutters, loaders, and motors that impose such a heavy burden upon the track structure.

The No. 5 will take such loads in stride. Broad, deep, and thick, it effectively resists vertical pressure; doesn't flatten out, buckle, or sag. Down the center-line, a special channel construction gives added support where it is needed most.

The tie costs only a little more than those of lighter section . . . and the slightly higher first cost is more than offset by increased life. Especially is this true in modern mining practice, where the trend is so definitely in the direction of heavier track-mounted equipment and bigger car loadings.

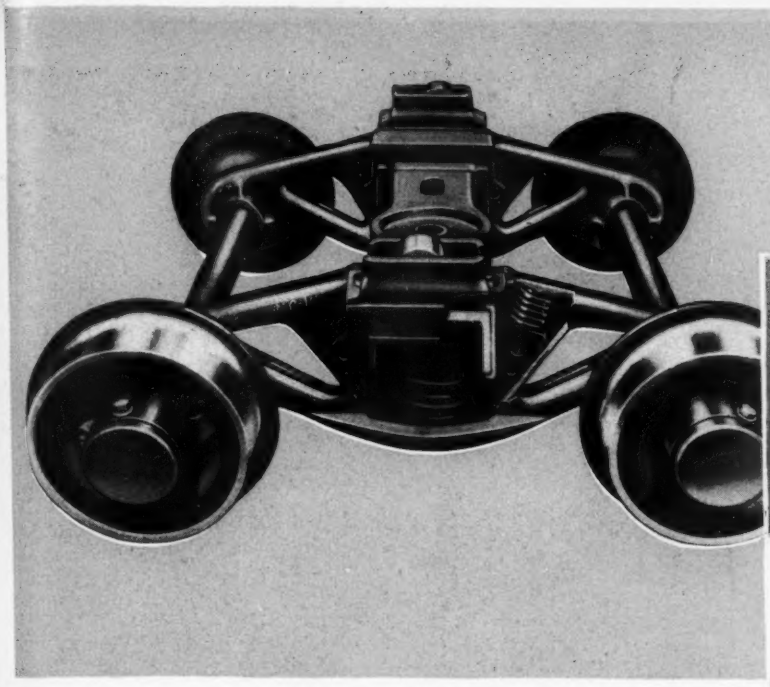
Installing the No. 5 is a quick, easy matter. Simply fit the stationary clip against the rail base; then tap the revolving clips into place. Repeat at the other end of the tie. That's all there is to it.

For good track from the ground up, make liberal use of Bethlehem No. 5's. They're a solid buy.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

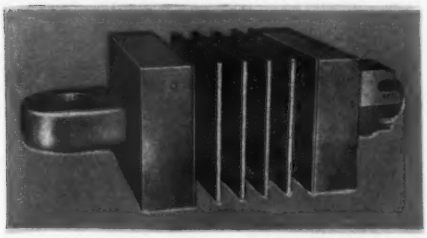
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cutaway) protection to equipment, roadbed and lading with maximum wear life.

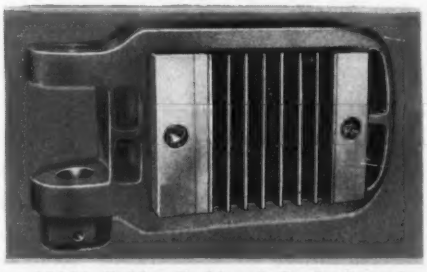
Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

NATIONAL *products cut per ton costs!*



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, *always specify National products.*



M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-3863

Be sure to visit Booth 1618 at the American Mining Congress 1951 Coal Convention and Exposition • May 14-17 • Cleveland, Ohio

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

NATIONAL Products FOR TRANSPORTATION AND INDUSTRY M&SC Est. 1868

WILLISON AUTOMATIC COUPLERS • NC-1 TRUCKS • DRAFT GEARS • NACO STEEL WHEELS

ROCKMASTER *blast by Fauzio Brothers at Lehigh Navigation Coal Company's Nesquehoning, Pa., stripping operation.*

No rock pile this . . . but the high point of a blast!

THE machine-gun camera reels off twelve photos—one every 1/3 second—to "freeze" at its peak this typical ROCKMASTER "16" blast—three seconds after initiation of the shot. Here you see no wasted explosives gas, no wild rock—proof that ROCKMASTER "16" blasting can mean true *controlled force . . . controlled throw . . . controlled breakage!*

ROCKMASTER "16" may be the answer to *your* problems whether your job calls for blasting coal, rock, ore. The free ROCKMASTER "16" booklet shows how you can profit through the use of the correct numbers of the *sixteen* ROCKMASTER milli-second delay electric blasting caps teamed with the ROCKMASTER system of explosives choice and loading methods. Write for your copy. Our technicians will be glad to assist you in applying ROCKMASTER "16" to your operations.

Less Bark *More Bite*

VISIT US

and See the advantages of the

Rockmaster System

Proved by Machine-Gun Camera Photos

at BOOTH 1400

American Mining Congress Coal Show

Public Auditorium

Cleveland, Ohio

May 14-17

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"Everything for Blasting"

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YOUR COAL CAN BRING

PREMIUM PRICES

WITH

MOBIL-MILL

PRECISION CLEANING!

Your **entire** coal output—the full range of sizes and grades to 3/32"—can be marketed at premium prices if you employ the **precision cleaning** of WEMCO HMS MOBIL-MILLS. Field reports continue to prove the flexibility, accuracy and efficiency of these modern coal cleaning plants. Typical of these reports is the case of a West Virginia operator who recently converted to a Mobil-Mill.

Operating 3 shifts per day at 143% of rated TPH capacity with feed size 2" x 3/16" and gravity of 1.49-1.51, this complete washing plant produces cleaned coal of only **3.3%** ash from a feed containing 15% ash. With only one operator per shift and magnetite losses between 0.5 and 0.7 pounds per ton feed, this operator claims his Mobil-Mill is **"the most efficient cleaning plant he has ever seen in 30 years of experience."**

Check these MOBIL-MILL FEATURES

- ✓ Prefabricated
- ✓ Low initial cost
- ✓ Low operating costs
- ✓ Clean, sharp separations
- ✓ Installed for you

Write today for complete information on how a Mobil-Mill can help you get premium prices for your coal.

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THICKENERS
SAND PUMPS
CONDITIONERS

No Slip-up on Greasy Ridge

MORE POWER ON THE JOB— TD-24's deliver 148 maximum drawbar horsepower—more than any other crawler—work 340 days a year for Greasy Ridge Coal Company.

WORKING IN BOTH DIRECTIONS, TD-24's and scrapers make a 2000-foot figure eight every six minutes.

Strip mine operator scrapes off overburden in both directions—a 2000-foot round trip every six minutes—with the TD-24

Under 25 feet of overburden 175 feet wide, at Greasy Ridge, Ohio, there's a coal seam—Pennsylvania No. 8 bituminous—unprofitable to mine until they put the "Champ"—the TD-24—on the job.

Now six International TD-24's are turning in a record of performance and economy, uncovering 30,000 tons of coal in six weeks' time.

Pulling 19-yard heaped capacity scrapers, the TD-24's faster time-cycle really pays off—works in both directions without lost time—each tractor digs and moves two heaped loads every six minutes, traveling in a 2000-foot figure eight round trip, dumping at each end.

Power, agility, easy steering, fast footwork—that's why the TD-24 pays off. See your International Industrial Distributor and get this kind of power working for you.

International Harvester Company, Chicago 1, Illinois

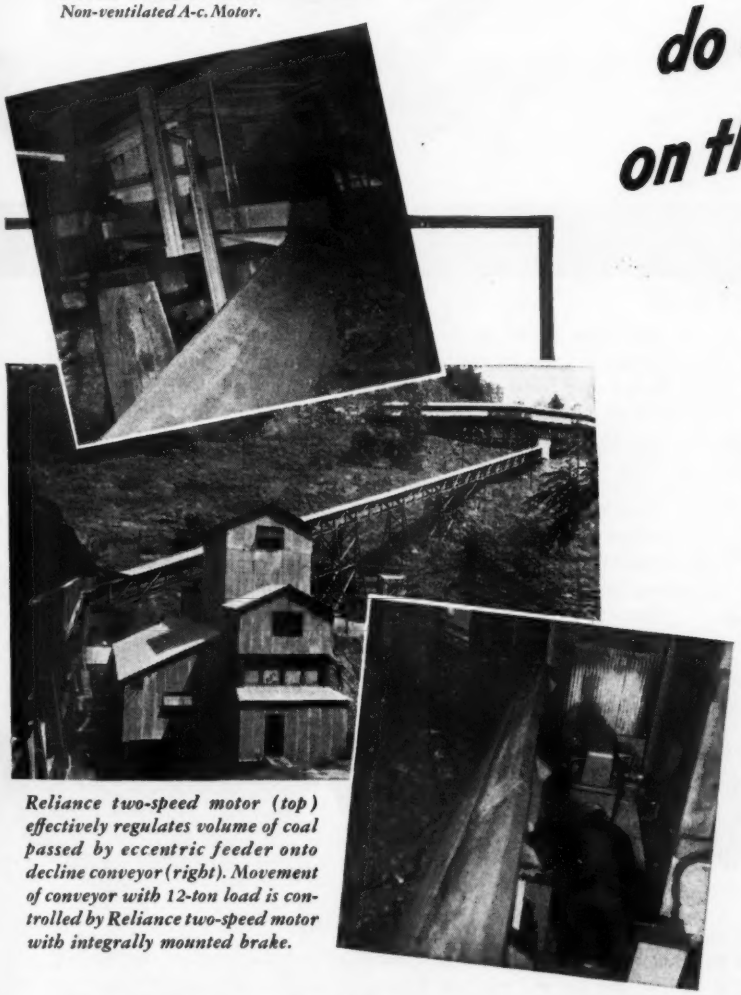
INTERNATIONAL INTERNATIONAL HARVESTER POWER THAT PAYS

Above ground, too...

RELIANCE
Precision-Built
MOTORS

Reliance PRECISION-BUILT Totally-enclosed, Non-ventilated A-c. Motor.

do a *Good* Job on the *Tough* Jobs!



Reliance two-speed motor (top) effectively regulates volume of coal passed by eccentric feeder onto decline conveyor (right). Movement of conveyor with 12-ton load is controlled by Reliance two-speed motor with integrally mounted brake.

Wherever coal is mined, more and more operators are discovering that Reliance PRECISION-BUILT A-c. Motors provide the maximum in dependable and economical power on every job above and below ground.

These rugged, long-lived motors applied to shaking and vibrating screens, washers, pumps, air tables, crushers, feeders and conveyors will offer you invaluable assistance in keeping production up and costs down. PRECISION-BUILT Motors are made in all standard enclosures, in sizes from 3/4 to 300 hp. Write today for Bulletins B-2101 and B-2201. For Explosion-Proof Motor data ask for Bulletin C-130.

See OPERATING EXHIBIT of RELIANCE MOTOR-DRIVES at the COAL SHOW in CLEVELAND
May 14—May 17 • Booths 1900 and 2001

Sales Representatives in Principal Cities

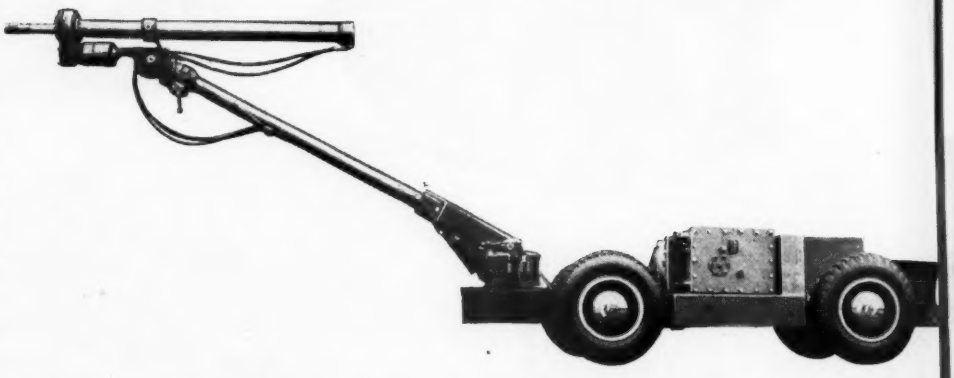
RELIANCE ELECTRIC AND ENGINEERING CO.

"All Motors are NOT Alike" • 1116 Ivanhoe Road, Cleveland 10, Ohio

EYE OPENERS

to be shown by DOOLEY BROS. at the Coal Show

Here are the facts about the new hydraulic. It's packed with power from one end to the other — driven by a 25 H.P. 250 Volt motor. Two wheels with individual drive — hydraulic tramming and two mounted drills operate at variable speed and feed. The tires are rugged 7.50x16 8 ply. This new unit is 22'6" long, 6'2" wide, 3' high and has a wheel base of 6'. This unit is highly maneuverable and has braking power to make it stay put. The NEW Superior hydraulic is the answer to all of your drilling needs.



Contactor assembly

Cut off switch

Cut-off and reset

We take pride in introducing this smooth operating safety switch to industry. So efficient in its operation that the slightest touch of a hand or elbow will instantly cut off the power on the entire machine. Originally built for DOOLEY BROS. drill arms and drills this contactor is applicable to any type of machine using electric power.

Current is turned on at the rear of the truck by a small, well protected button. After the machine becomes live all current can be shut off instantly by either drill operator or from the rear of the machine simply by touching any one of the three mushroom type cut-off buttons. In order to make the machine operational again it is necessary to push the button at the rear of the truck.

VISIT OUR BOOTH No. 1902-4-6

As applied to other types of equipment additional cut-off switches may be added as necessary so that the current may be broken from any number of points on the machine.

DOOLEY BROS.

1201 S. WASHINGTON ST. PEORIA, ILLINOIS

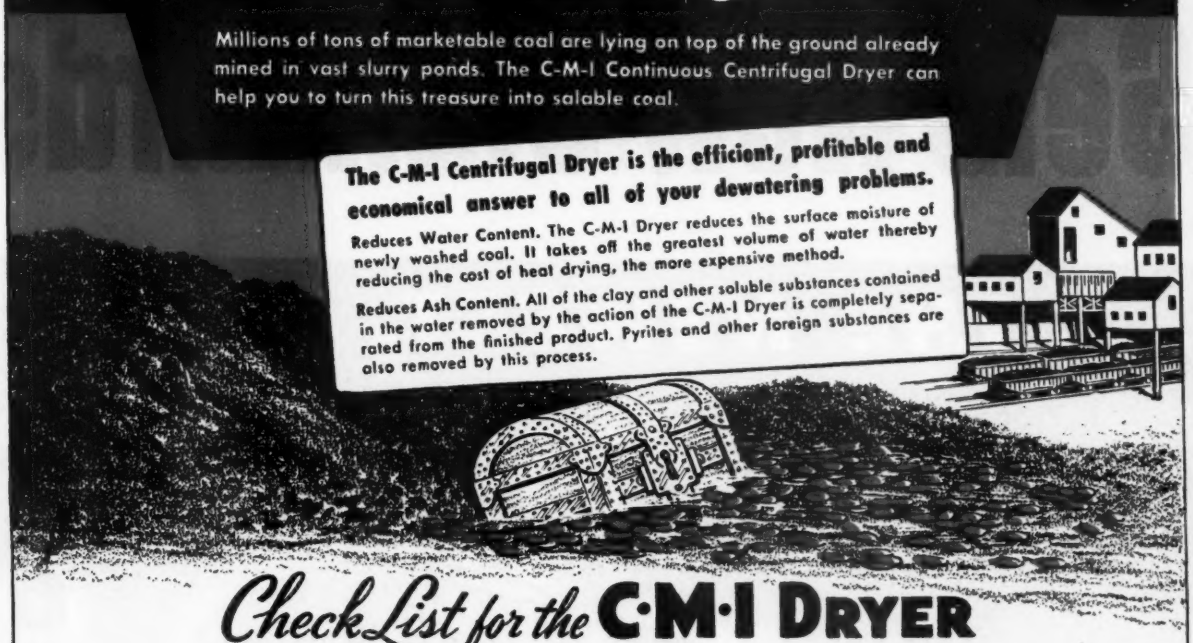
All TREASURE *isn't buried in Sand!*

Millions of tons of marketable coal are lying on top of the ground already mined in vast slurry ponds. The C-M-I Continuous Centrifugal Dryer can help you to turn this treasure into salable coal.

The C-M-I Centrifugal Dryer is the efficient, profitable and economical answer to all of your dewatering problems.

Reduces Water Content. The C-M-I Dryer reduces the surface moisture of newly washed coal. It takes off the greatest volume of water thereby reducing the cost of heat drying, the more expensive method.

Reduces Ash Content. All of the clay and other soluble substances contained in the water removed by the action of the C-M-I Dryer is completely separated from the finished product. Pyrites and other foreign substances are also removed by this process.



Check List for the C·M·I DRYER

	✓ YES	NO
Efficient—The C-M-I Dryer will reduce the water content of 28 tons of slurry from 82% to 7½% in less than one hour!	✓	
Profitable—Figures submitted by operators using the C-M-I Dryer show that in slurry salvage alone, the extra profits will pay for the equipment in a few months time.	✓	
Capacity—The large C-M-I Dryer will handle as much as 75 tons of ⅜" x 28 mesh coal per hour, reducing the water content from 25% of surface moisture to 6% or less.	✓	
Durable—All parts are made of the best metals obtainable. Revolving parts are dynamically balanced on the latest type of balancing machine.	✓	
Economical—In many instances, the C-M-I Dryer eliminates costly heat drying normally required.	✓	

C·M·I CENTRIFUGAL DRYER

If you are interested in how your dewatering problems may be solved with a C-M-I Dryer, write to us, stating the sizing of the coal, such as the percentage on 8 mesh, 10 mesh, 20 mesh, 35 mesh, 65 mesh and 100 mesh standard Tyler screens, and also the amount passing through 100 mesh. We will make our recommendation at no cost to you.

CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.
146 PRESIDENT STREET ST. LOUIS 18, MO.

ALLIS-CHALMERS
Sets New Standards

. . . THE NEWEST, FINEST

model **HD-20**
Hydraulic Torque Converter Drive
175 net engine hp.
41,800 lb.

model **HD-15**
102 drawbar hp.
27,500 lb.

Get the full story from your Allis-Chalmers dealer.
See these tractors perform. They're built for YOUR job!

for Tractor Performance
for Lasting Durability
for Simplified Servicing
for Ease of Operation

TRACTOR LINE ON EARTH

model **HD-9**
70 drawbar hp.
18,500 lb.

model **HD-5**
40.26 drawbar hp.
11,250 lb.

Originator of the Torque Converter Tractor

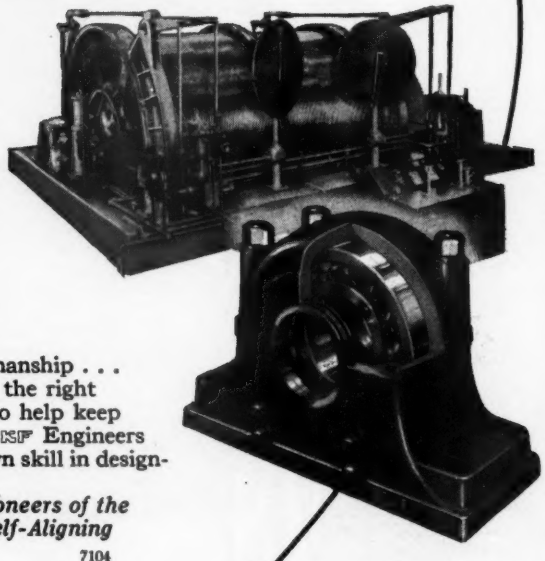
ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

"Effortless Control" IN MINE HOISTS

AIDED BY CRAFTSMANSHIP IN BEARINGS

bearings engineered by **SKF**



Vulcan Iron Works designed this highly efficient mine hoist to provide the operator with "effortless control" . . . grouped operating levers and instruments at a control desk. And they've kept friction at the minimum by using seven SKF SDAF Heavy-Duty Pillow Blocks with Spherical Roller Bearings. Four of the SKF Pillow Blocks are installed on the pinion shaft . . . three on the main drum shaft. For many years, SKF Ball and Roller Bearings have been first choice of builders of equipment that must operate uninterruptedly under the toughest sorts of conditions. They know that thanks to SKF Craftsmanship . . . built up from priceless experience in pioneering exactly the right bearing for the right job . . . they can bank on SKF to help keep friction and power consumption at the minimum. Let SKF Engineers show you how SKF Craftsmanship can augment your own skill in designing for greater operating efficiency and economy.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA., *the Pioneers of the Deep Groove Ball Bearing, Spherical Roller Bearing, Self-Aligning Ball Bearing.*

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SKF

BALL AND ROLLER BEARINGS

8 REASONS WHY SKF IS PREFERRED BY ALL INDUSTRY

INTEGRITY · METALLURGY · TOLERANCE CONTROL · SURFACE FINISH · PRODUCT UNIFORMITY · ENGINEERING SERVICE · FIELD SERVICE

Cold Facts about Securityflex

COLD RUBBER

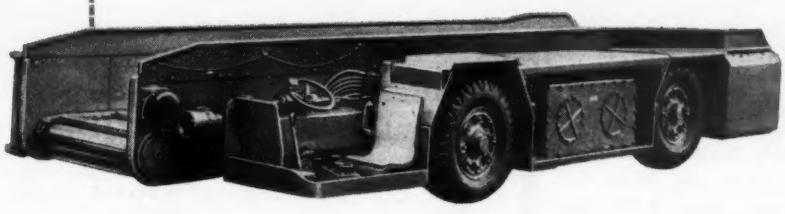
Insulated Cable for your mine

It's the

toughest

shuttle car

cable you can buy



It's tougher to short circuit!
It's tougher to cut!
It's tougher to crush!
It's tougher to abrade!
It's tougher to break!
It's tougher to permeate with water!
It's tougher to fatigue from repeated short radius bending!

Anaconda *specializes* in the manufacture of shuttle car cable and cable for the new continuous mining machines. Let us show you this famous SECURITYFLEX* Shuttle Car Cable with cold rubber insulation—and tell you what it can do in your mine. Just send a note to your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York. 51330

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WIRE AND CABLE

NEW EFFICIENT MINE STOPPING METHOD
USES AMAZING G. E. SPRAYABLE PLASTIC FILM

COCOON®

You've heard about our original COCOON—it's the tough, waterproof, acid-proof sprayable plastic that has been used by the Army and Navy to "wrap up" everything from B-29's to battleships.

Now a special version of COCOON—G. E. COCOON, is proving highly useful in mine stopping applications, providing a flexible, continuous seal which can be applied quickly, without special skills. Get the whole COCOON story—write today for details.

HERE'S HOW G. E. COCOON IS USED

- For Temporary Stoppings on Brattice Cloth
- For Dry Walls of Concrete Block
- For Repairs of Cracked Concrete Walls or Broken Overcasts
- For Roof and Ribs to Prevent Spalling

AND HERE ARE SOME OF THE *BIG* ADVANTAGES OF G. E. COCOON

1. More effective sealing makes ventilating systems more efficient—cuts operating costs of fans and pumps.
2. Saves money by facilitating recovery of stopping materials (G. E. COCOON can be reused many times).
3. Is absolutely non-toxic—can be sprayed in confined areas without masks using standard pressure spraying equipment.
4. Acid and moisture-proof; will not mildew or rot.
5. Recommended spraying equipment includes 2-wheel, mobile air compressor. Weight 275 lbs.—L. 26", W. 17", H. 24".

COCOON

Whiz

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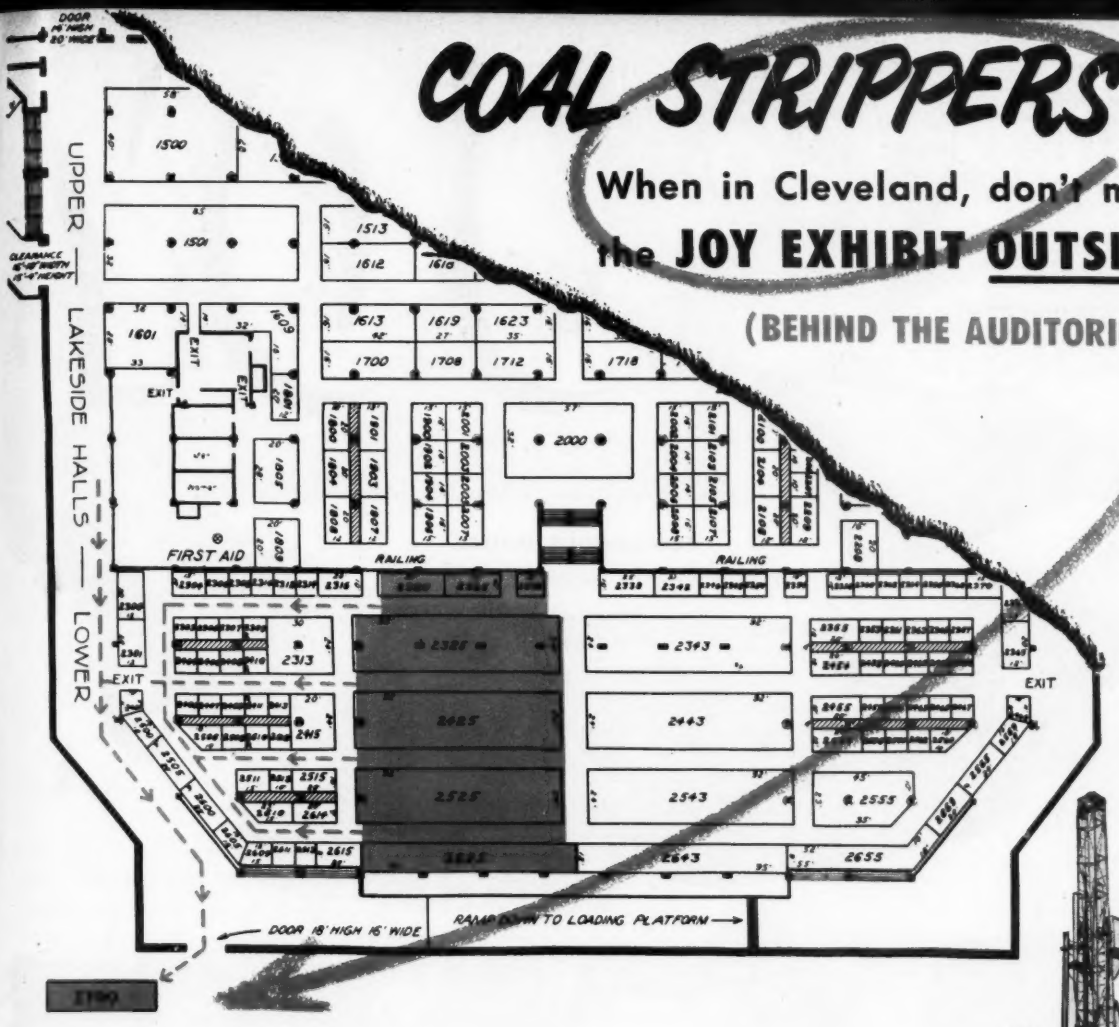
SEE IT FOR YOURSELF!

Let our engineers recommend a G. E. COCOON application to meet your specific problem. Demonstrations and training courses for your men can be arranged at our Camden offices and, in many instances, at your own mines. Write for information.

COAL STRIPPERS!

When in Cleveland, don't miss the JOY EXHIBIT OUTSIDE

(BEHIND THE AUDITORIUM)

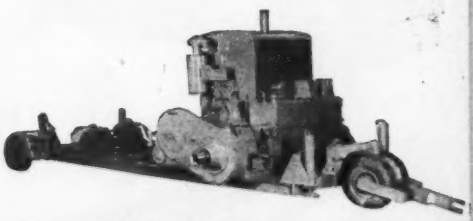


When you see the Joy exhibit on the main floor of lower Lakeside Hall (the solid orange space), you'll see the largest collection of mining equipment ever displayed by a single company. But don't overlook the additional Joy machines on display behind the Auditorium. The dotted orange lines on the map above show the way from the main Joy exhibit to the outside display.

See the revolutionary Champion Blast-Hole Drill *in action!* Actually drilling several times a day. Consult the clock in the main Joy exhibit for times of demonstration. Or just ask anyone in attendance at the Joy booth.

Also on operating display behind the Auditorium is the new Joy AD-3 Highwall Recovery Auger. You'll want to see this powerful drill in operation.

The Joy Champion Blast-Hole Drill utilizes the new high-speed principle of rotary-airblast drilling, a Joy development.



The Joy AD-3 Highwall Recovery Auger. A powerful new unit for coal recovery from highwalls. Permits tremendous tons-per-man output.

W&D CL-3581

HIGHSPOTS of the COAL SHOW

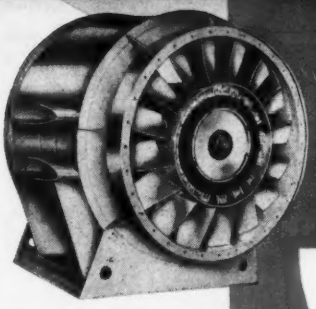
THE JOY EXHIBITS... INSIDE and OUTSIDE

JOY

AXIVANE* MINE FANS

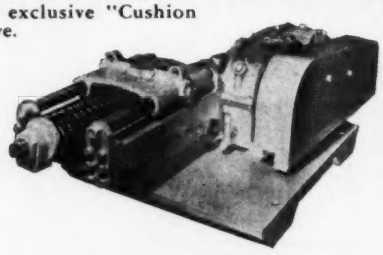
Vaneaxial-type fans for all main ventilation requirements—also Portable Blowers for auxiliary ventilation.

*Reg. U.S. Pat. Off.



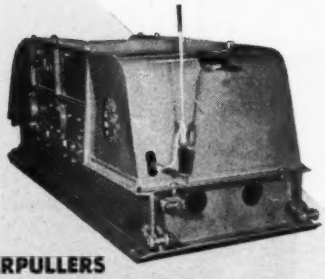
SHAKER CONVEYORS

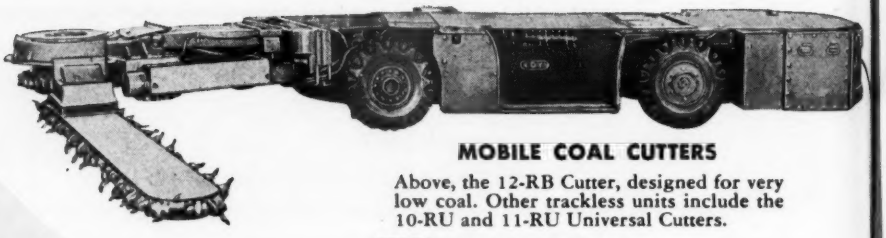
Below, the exclusive "Cushion Stroke" drive.



CONTINUOUS MINERS

Models for high and low coal.



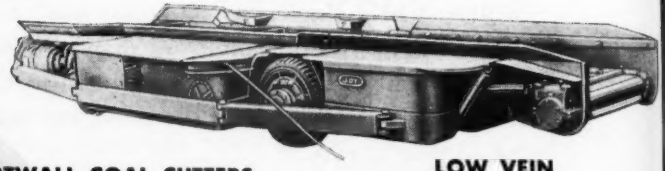


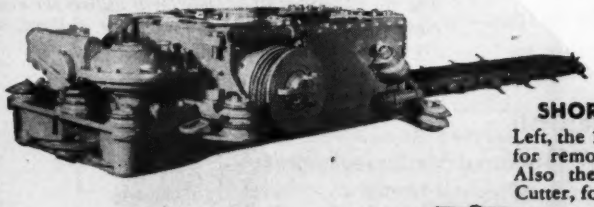
MOBILE COAL CUTTERS

Above, the 12-RB Cutter, designed for very low coal. Other trackless units include the 10-RU and 11-RU Universal Cutters.

CARPULLERS

Other utility equipment includes a Caterpuller, Pulldozer, Timber Setter, Material Trucks, etc.



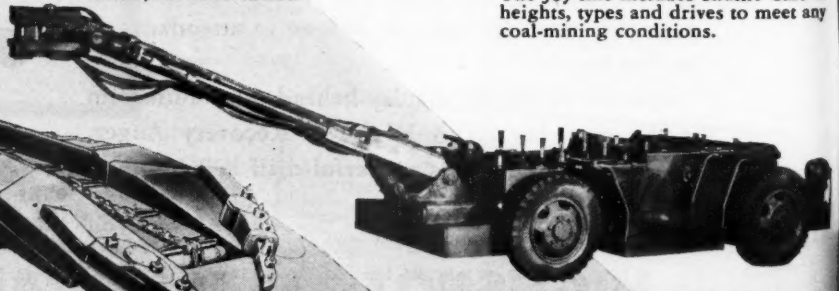


SHORTWALL COAL CUTTERS

Left, the 11-B Cutter, with Joy Bugduster for removal of cuttings from the kerf. Also the 7-B Heavy Duty, and 5-B1 Cutter, for small mines.

LOW VEIN SHUTTLE CARS

Above, the 8-SC Shuttle Car, only 26″ high for use in very low coal. The Joy line includes Shuttle Cars in heights, types and drives to meet any coal-mining conditions.



MECHANICAL LOADERS

Above, the 20-BU, a high-capacity Loader only 24″ in height for very low coal. Other Joy Loaders to meet any need.

HYDRAULIC ROOF-BOLTING DRILL

Above, the RBD-1, fastest drilling machine built for roof bolting. Joy also builds a complete line of hydraulic Coal Drills, single and twin boom.

...Your Complete Source of Mechanized Mining Equipment

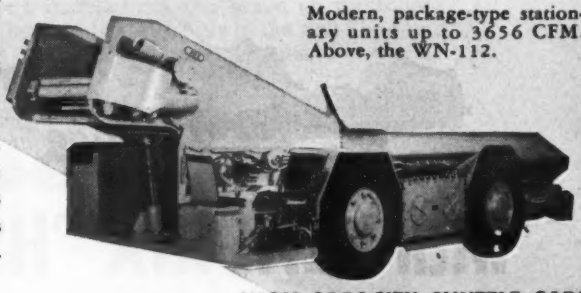
FIELD-PROVED to Give You Greatest Production Increases and Cost Reductions

AIR COMPRESSORS

Modern, package-type stationary units up to 3656 CFM. Above, the WN-112.

JOY Mechanized Mining Equipment is the result of years of pioneering research, development and on-the-job engineering. It is the world's most complete line of modern mining machinery, built by the world's largest manufacturer in the field.

These facts have real importance for you because they give you positive assurance of equipment that can stand the gaff, stay on the job and operate with the sustained high efficiency that means greater tonnage and lower costs. Whatever your requirements or seam conditions may be, in soft coal or hard, there's a field-proved JOY unit to do the job *best.* ● Let us work with you.

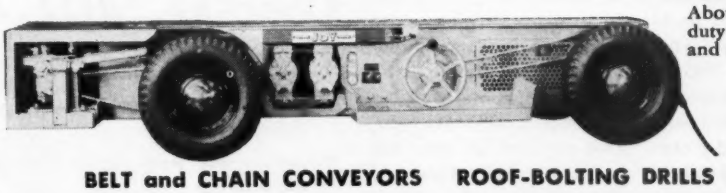


HIGH-CAPACITY SHUTTLE CARS

Above, the 10-SC—a rugged, heavy-duty Shuttle Car that can handle coal and rock in full seam mining.

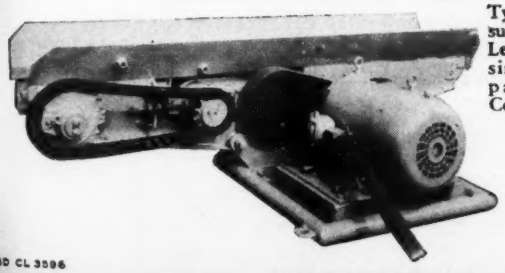
PERMISSIBLE MINE-AIR COMPRESSORS

B. of M. approved. Self-propelled (the WK-83, right) or draw-bar models, up to 240 CFM.



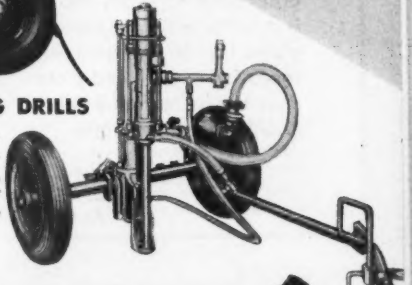
BELT and CHAIN CONVEYORS

Types and sizes to suit any conditions. Left, the new, light, simple and compact FA Chain Conveyor.



ROOF-BOLTING DRILLS

Right, the highly-mobile, fast-drilling SAW Wagon Stoper. Other drills for any roof-bolting need.



W&D CL 3596

Consult a Joy Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

Stand-Up Stamina

ON COAL STRIPPING OPERATIONS...

with HENDRIX "HS" heavy duty buckets!

Wherever there's overburden to be moved . . . wherever there's need for *extra* performance, *extra* stamina, *extra* dependability . . . there you'll find a job that's made-to-order for a HENDRIX "HS" Heavy Duty BUCKET. The "HS" is armored with cast manganese steel runners and wearing plates and is equipped with renewable manganese steel shoes for runners and plates. Those parts which wear the most *can be replaced right on the job* . . . saving time and resulting in more profits

Check Our Exhibit
SPACE No. 1216
At the Coal Show

COMPARE THESE FEATURES

- ★ *20% to 40% lighter than other buckets, type for type.*
- ★ *All welded construction for greater strength and durability.*
- ★ *Manganese steel chains, fittings, and reversible tooth points.*
- ★ *14% cast manganese steel lips with tooth bases cast integrally.*
- ★ *Failure-proof arch of rugged box-section construction.*
- ★ *⅜ to 40 cubic yards. With or without perforations.*

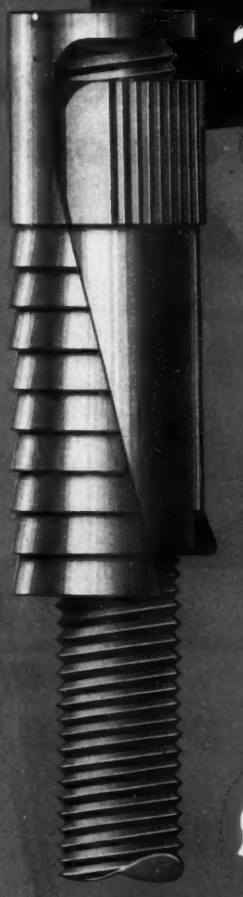
★ *Parts shown in color are of Cast Manganese Steel.*

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

HENDRIX MANUFACTURING CO., INC.

MANSFIELD – LOUISIANA

HUBBARD *Wedge Nut Style* *Mine Roof* Anchor Bolts



THE illustration at the left shows the general appearance of the new Hubbard, Wedge-Nut Style, Mine Roof Anchor Bolt. It is the second major development in this field by Hubbard Engineers, and provides a mine roof support for those users who prefer maximum head room, installation without special tools and an efficient, sturdy, simple, easy to install type of bolt.

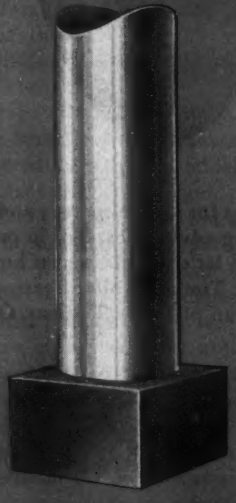
It consists of a ¾-inch bolt, furnished in any desired length, and made with a **full square head.** The standard chamfering has been omitted on this bolt head in order to offer a maximum wrench hold, and eliminate the costly nuisance of sockets slipping off the head during installation.

The Wedge-Nut consists of two wedge shaped parts. On turning the bolt into the Wedge-Nut, the two parts are drawn longitudinally on each other and forced against the walls of the hole by the action of the wedge design.

Hubbard Mine Roof Bolts are easy to install, require no special tools for installation, and leave no projections from the roof beyond the thickness of the bolt head and support plate. Write for additional details.

Maximum Head Room

Maximum Safety



Patents Applied For

Maximum Head Room—Note that the only projection below the roof of the shaft is the head of the bolt plus the thickness of the support plate used. Maximum clearance means more efficient production and greater safety.

Easy Installation — No Special Tools—Means saving in production costs. Simple Wedge-Nut design consists of only two parts, with the mine bolt itself as a third part. Nothing to get out of order—No parts to lose.

Labor-Saving—The full size square head on Hubbard Wedge-Nut style Mine Roof Bolts is formed without the usual chamfering—Corners are full, so that sockets cannot slip off with a consequent loss of valuable time.

Visit Hubbard Exhibit
Booths 935 and 937—Coal Convention, Cleveland

HUBBARD AND COMPANY

PITTSBURGH • CHICAGO • OAKLAND, CALIFORNIA

Your hauling costs can be cut!

Here are 8 big reasons why TIMKEN® bearings cut your costs of hauling coal and ore

1. **GREATER RESISTANCE TO SHOCK LOADS.** Timken tapered roller bearings are made of Timken® fine alloy steel and case-hardened to provide a hard, wear-resistant surface and a tough, shock-resistant core. On over 500,000 mine cars Timken bearings have proved they can take the shock loads in their stride and insure trouble-free mine car performance.

2. **GREATER CAPACITY.** Loads are carried on a *line* of contact between rollers and races.

3. **EASY STARTING, LONGER TRAIN LENGTHS.** True rolling motion of Timken bearings reduces friction, permits easy starting and more cars per train.

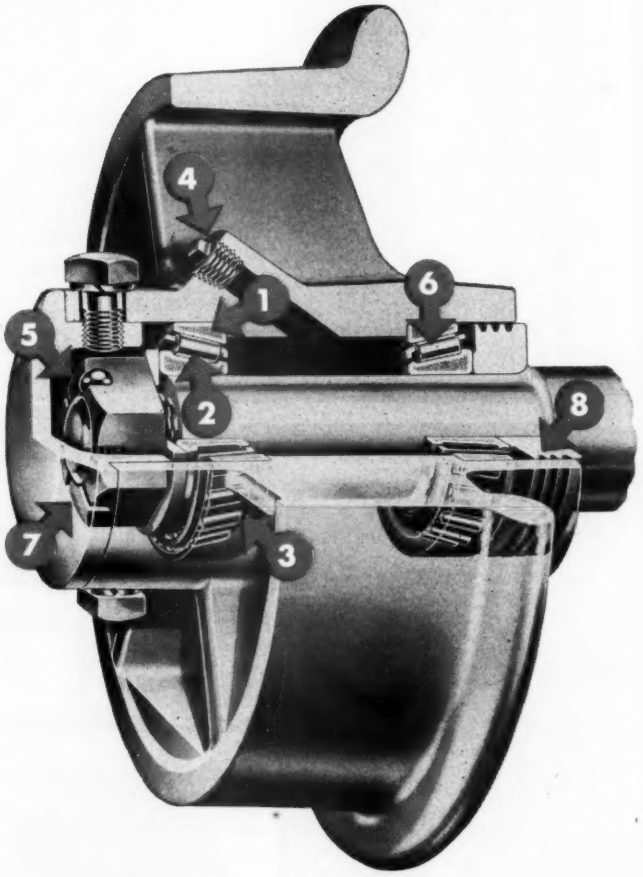
4. **PERIODIC LUBRICATION.** No matter what kind of bearings you use, periodic lubrication will lengthen their life, reduce your costs. Replacing old, dirty, moisture-laden grease with fresh, live, protective grease is cheap insurance for trouble-free car operation.

5. **INSPECTION SIMPLIFIED.** Wheels can be easily removed for bearing inspection by simply pulling the cap, cotter pin and nut.

6. **CARS TAKE CURVES EASIER** because Timken tapered roller bearings take both radial and thrust loads in any combination. No special thrust plates or bearings needed.

7. **ADJUSTABLE FEATURE INCREASES BEARING LIFE.** Timken bearings in well-maintained cars show practically no wear. However, if some wear should occur after long years of service, the resulting bearing looseness can be removed simply by tightening the nut.

8. **DUST COLLAR PROTECTS LUBRICANT.** And it increases the effectiveness of periodic lubrication by permitting old grease to be flushed from the bearings when new lubricant is added.



Specify Timken roller bearings for *your* mine cars and assure yourself of all these cost-saving advantages. Call in our mine car bearing experts today and let them show you how your hauling costs *can* be cut! The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

Cut your hauling costs by specifying **TIMKEN** TAPERED ROLLER BEARINGS

TRADE-MARK REG. U. S. PAT. OFF.

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION →✳←

Mining CONGRESS JOURNAL

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JOHN C. FOX, Editor

APRIL

VOLUME 37 1951 NUMBER 4

Spring Time is Seed Time

APRIL marks the end of winter's blustering and the return of life to the woods and fields. The first soft green shows in the meadows and the farmers begin to sow the seeds which will later feed the world. For the mining industry, this year April brings the preview of the biennial "Coal Show" of the American Mining Congress.

Once every two years there is added to the annual Coal Convention the Exposition to which are attracted not only coal miners from every producing field, but metal miners and miners of nonmetallic minerals as well, to see all the latest mining and preparation machinery, equipment and supplies; to meet friends whom they may not have seen since the last Coal Show; and to make new friends whom they may not see until the next. Behind them are the winter months of striving to produce the raw materials and energy that make this nation of ours unparalleled in all history for its standards of living and its efforts to raise, not to raze, the rest of this troubled world. Never before has a nation as powerful as this one sought to lend a helping hand to its sister nations.

To continue to serve in ever increasing measure, to continue to expand production for peaceful pursuits, or for defense against those who purposefully misunderstand our motives, requires more and more of the products of our mines. At the Coal Convention sessions are discussed the problems which confront the miner aiming to do a better, safer job. In the exhibit areas are shown, many for the first time, the machines, the equipment and the operating supplies which will help him to hit the bullseye on this target.

To every Coal Show the mining companies send men who hold the key operating positions, the men to whom will be entrusted the carrying-out of the plans devised by their engineers. Here these men have an opportunity to see the tools with which they are going to work and to discuss their ideas with each other and with the specialists sent by the manufacturers to explain the application and operation of these tools.

At the Coal Show in the spring are sown the seeds which will later warm the world and provide the energy to turn its wheels.

Venture Capital Galore

RECENT investigations by Senate committees of gambling, rackets and corruption are bringing into the open some startling facts. Among these is the wide prevalence of gambling, in one form or another, which channels untold millions to the pockets of the czars of the underworld.

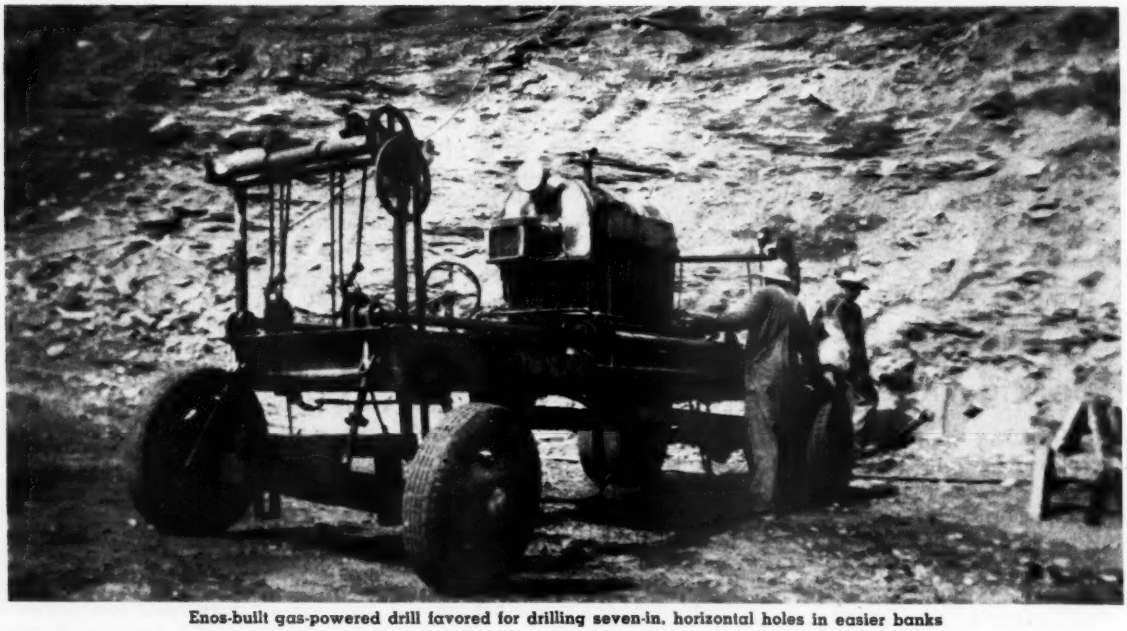
Gambling as such seems to be one of the earlier forms of recreation indulged in by man. Various devices and games of chance have been found among the bones of almost every culture so far unearthed by archeologists in all parts of the globe. It is the gambling instinct, sublimated to a certain extent, that is responsible for much, if not all, of the progress made by man. On what is our entire monetary credit system based but the desire to put in a little and get something more out? What is the practice of grubstaking a prospector but placing a bet, at long odds too, that he will come home a winner with a worth while mineral deposit?

How does the government propose to encourage prospecting and development work? By placing a bet, in the form of a "loan," on companies or individuals promising to do on a grand scale what the grubstaked prospector hopes to do. True, through careful investigation and weighing of fact and estimate, the government or other large investor tries to reduce the odds against recovery of investment plus profit, but the investment is made with full recognition that the returns may be zero.

It is hereby respectfully submitted that there should be a slackening of the Federal reins which prevent the average would-be investor from "taking a flyer" in mining enterprises. There is loud outcry against the lack of "venture capital" for the mining industry on the one hand and great sentiment on the part of self-appointed guardians of the "little man" for protecting the investor on the other.

To a great extent, this small investor with but a few dollars to risk is now so over-protected that millions rush to pour their money by devious routes into the pockets of the sultans of vice, dope and political corruption. Very little of this income ever finds its way into the Federal or State Treasuries either.

Of course there have been abuses of the public confidence in the past by stock selling schemes in non-existent mines and other spurious ventures—although those hurt by such schemes are few compared to the millions now mulcted by the numbers racket and large-scale betting rings. A proper amount of supervision to prevent fraud, not enough to take out the spice, nor the profit, is certainly necessary. But it does seem—with the need of venture capital to find and develop new mineral deposits to help preserve the way of life that provides the dollars, many of which now contribute to notorious corruption—that a way could be found to divert this money into channels more useful to the individual, the state and the world we live in.



Enos-built gas-powered drill favored for drilling seven-in. horizontal holes in easier banks

Overburden Preparation at Enos Mine

Features Use of Compressed Air in Vertical Drilling

By W. J. CRAWFORD
Vice-President
Enos Coal Mining Co.

TO present the application of compressed air vertical drilling on the Enos property, it is necessary to review briefly the character of the overburden, the plan of stripping, and also methods of drilling and blasting.

At Enos the topography is mostly a series of small hills and valleys, probably less than one-half being rolling or level. The cover being removed at present averages 50-55 ft in one pit and 55-60 ft in the other. The maximum stripping handled on this property in the past was 94 ft.

There is a slate and shale strata directly above the coal, which accounts for the standard practice of horizontal drilling. No massive limestone is encountered in this area, but it is not uncommon to see lime seams from two-five ft thick. Ten-twelve-ft seams have been the maximum; this is in the section of the bank broken by the horizontal holes. Much hard shale is present and which, unless well displaced by blasting, causes difficulty in digging the overburden. The shale is overlaid with layers of red sand-rock, usually not very hard, and above this from 6-18 ft of top soil. The top soil, soft red sand-rock and shale is amenable to dry rotary drilling of the auger type, which comprises most of the vertical drilling at Enos.

A boulder formation in this top sand seam or a thin layer of bastard limestone is frequently encountered that is definitely not adaptable to dry auger drilling. This was one of the contributing factors toward the purchase of the compressed air outfit. We have also in the past had material of a crumbly or squeezy nature. One of our worst drilling situations was in an area embedded with lime boulders two-five ft thick near the surface. Around these boulders were pockets of water, and holes became wet immediately. This area had to be well drilled, and holes instantly loaded with gelatin dynamite. So far, we have not experienced any overburden of this type with our compressed air operation. The balance of our material is usually a grey sandstone. Some of this has white laminated streaks running through it which is usually a sign of hardness. Sometimes it is seamy and has a tendency to break out in big boulders; sometimes it is in the upper portion of our high banks and sometimes in the lower portion.

Stripping Checked Daily

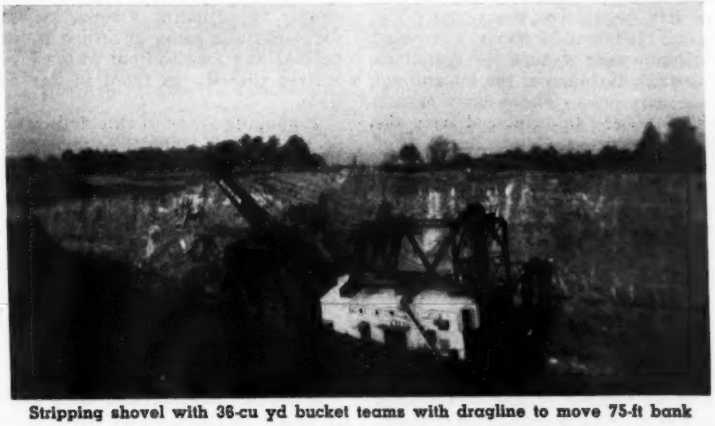
The stripping units of Enos at the time of writing of this paper consist of two Bucyrus-Erie shovels. One has a bucket capacity of 36 cu yd, boom length 113 ft, dipper sticks, 64 ft; the other has a bucket capacity of 22 cu yd but it is to be replaced by a duplicate of the 36-yd unit which is now in the process of erection. Both shovels are aided by pull-back machines on the spoil, these being 6 cu yd Bucyrus-Erie walking draglines, boom length 90 ft.

The 36-yd shovel has a standard performance, set by time-study, at

1620 cu yd per hr. It is capable of moving 1,000,000 cu yd per month. For the four-month period of August to November inclusive, in the West Pit, it averaged 984,190 cu yd, the average height of bank being 53 ft, width of cut 57 ft, average cu yd per hr 1544, percent of standard 95.3 percent and shovel activity 87.2 percent.

A blueprint of the strip pits at Enos would usually reveal lateral haulage roads leading from a main haulage road into the pits approximately every 1000 ft and at each end. This arrangement conforms nicely with the methods of drilling and shooting the overburden. The back or highwall side of the pit is left solid and trimmed up by the shovels with the aid of tractors used in conjunction with the stripping shovel. This facilitates the horizontal drilling which is done in the pit and follows directly behind the shovels. Normally, these shovels take a 50-60-ft cut. Pit width is maintained at 85-95 ft.

Enos stripping territories are cross-sectioned every 100 ft, and from these stations the engineers measure the daily output of the shovels. This check-up of yardage measurements enables the management to see what is happening daily, and the influence of varying situations upon shovel performances. It affords also an opportunity to apply corrective measures immediately—not weeks or months later, after considerable losses have occurred. Due to the excessive amount of surface water, much effort and money are spent for drainage ditches to divert the water from the pits, and also on dams for controlling the water in the pits. Therefore, the length of pits is relevant to the drainage problem.



Stripping shovel with 36-cu yd bucket teams with dragline to move 75-ft bank

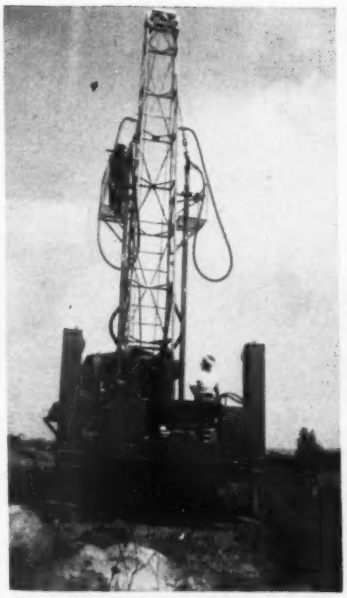
Use Drill Suited to Bank

Horizontal drilling has been found to be the most convenient and by far the most economical in banks up to 45 ft, and in some instances up to 50 ft. As has been previously stated, horizontal holes are drilled following the stripping units. These are usually drilled on 20-ft centers and 50 ft deep.

Horizontal holes seven in. in diameter are drilled with two types of drills, the choices dependent upon the formation directly above the coal. An Enos-built self-propelling gas driven drill is favored with the easier banks; the other is the Joy Stripborer. For our use this is the best all-around type on the market today; it is adaptable to all kinds of horizontal drilling—low, high, angle, hard or soft. This is an improved model of the original Sullivan Stripborer, developed on the Enos property several years ago. One of its most desirable features is its hydraulic feed of six ft instead of 14 in.

Where horizontal holes alone will not produce satisfactory bank preparation, they are supplemented by vertical holes of seven in. diam. These are drilled chiefly with three dry auger electric rotary drills made in the Enos shops, mounted on wheels and pulled by tractors. They have shown good performance, and have drilled approximately 90 percent of the banks in the past, but where hard sand or lime boulder formations are present, two churn drills were available. The churn drills have also been used in re-opening old pits where sidewall holes were an impossibility. The two new Joy Champion drills replace the churns, and also will do a part of the drilling that was done by the dry rotaries in the past. The depth and pattern of the holes are determined by the height and nature of the overburden.

A typical group shot in this bank would consist of 10 horizontal holes and 16 vertical holes, loaded with LOX and shot simultaneously. Considerable burden is thrown into the pit by this method, and does not have to be handled by the shovel. Delay caps are used in the holes next to the adjacent shot in both vertical and horizontal holes. The open-cut method of drilling and shooting is standard practice at Enos. This method has its advantages and disadvantages. However, in consideration of the stripping procedures and types of overburden encountered it has proved most convenient and economical.



Compressed air removes cuttings from roller-cone bit in new rotary pressure drill application for blastholes

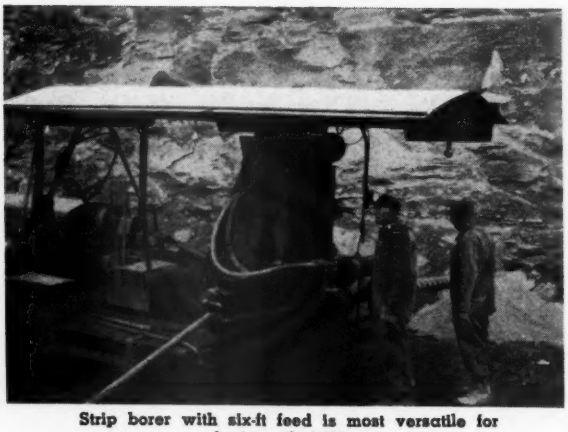
LOX Cartridges Fireproofed

The process of producing liquid oxygen in the LOX Plant consists of cleaning and compressing air, then liquefying and rectifying it. The plants at Enos use the Claude process.

Enos has recently installed a new plant tripling the production of LOX, in order to have ample supply of explosive for the two modern shovels for operation in the higher overburdens. This plant was purchased from L'Air Liquide, headquarters in Montreal, Can. It has a four-stage compressor as compared to three stages in the old units. It develops 2200 lb working pressures; the three-stage had 1200 lb. This plant has a capacity of 300 liters per hour. The working force consists of eight men—four operators, three men making cartridges and one foreman. This new unit produces liquid oxygen of 99 percent purity, as compared with 90-92 percent from the old units.

The liquid is delivered from the column into two 625-liter storage tanks inside the plant. When one tank is full and the other is approximately two-thirds full, the full tank is blown down through a transfer pipe to a big storage tank located in the pouring house approximately 100 ft away. The removal of this liquid is accomplished by opening and closing valves, allowing evaporation of oxygen gas sufficient to produce pressure of eight-

LOX plant produces ample liquid oxygen, 99 percent pure, for blasting high overburden



Strip borer with six-ft feed is most versatile for horizontal drilling

ten lb which evacuates the storage tank. The main storage tank is cylindrical in shape and holds 15,000 liters of liquid oxygen (37,500 lb). It is located between two driveways and contains two 1½-in. pouring spouts from each side. Soaking boxes lined with stainless steel and insulated with fiber glass containing eighty 5¼-in. cartridges each can be poured four at one time, two each on separate trucks. This operation can be done in less than 10 minutes.

The explosive produced here is unique in that both absorbent and cartridge bags are fireproofed. The plant includes facilities for fireproofing the absorbent, production of cartridges, as well as manufacture and storage of liquid exygen. The absorbent, a granular char, is received in 35-lb paper bags. It is fireproofed in batches of 90 cartridges. Before entering the mixer, it is screened to remove any foreign particles. The treated cartridges contain approximately 10 percent phosphoric acid and 18-20 percent moisture. The cartridge bags are fireproofed with diammonium phosphate by the manufacturer.

The cartridge ready for soaking weighs approximately five lb. The absorbent represents 3.5 lb. Cartridges soaked for field use weigh 15-16 lb. They are of 5¼ in. diam. 20 in. long. Including plant losses, approximately 21 lb of liquid oxygen are used per cartridge shot.

This treated explosive has been in use at Enos since 1941, with very satisfactory performance—first, from the standpoint of safety; second, economy; and third, explosive qualities. Present costs are approximately 60 percent of the commonly used dynamites in strip-pits. The cubic yards shot per LOX cartridge in the aforementioned pit in this article averaged 101. In the other pit, the average is 75. The cubic yards shot per foot of hole are 30 and 21.5, respectively.

We do not agree that fireproofing has decreased the effectiveness of our explosive. Our experience in the field has led us to believe that the moisture has added rather than detracted from its propulsive strength.

New Drill a Success

Rotary pressure drilling utilizing roller-cone type bits and compressed air for removal of cuttings is a new development in blast-hole drilling. The rotary principle of rock-drilling had been proven in the oil fields years ago; however, the hydraulic feed principle came forward with the recent development of the roller-cone bit.

Experimental work which led to this new drill began five years ago. The original models used water, circulated by a pump that washed the grindings away from the face of the bit and out of the bore hole. These early models had the rotary table placed near the rear of the machine instead of through the center, as in the present ones. Wet rotary drilling involves considerable regrinding of the larger pieces before they can be washed away, thus greatly reducing the drilling progress.

The innovation of compressed air as a hole-cleaning medium was found to increase drilling speeds, eliminate the necessity and hazards of water, and increase bit life—in all, the answer to a great number of problems. This drill was originally designed for quarrying. Its first appearance in coal stripping was at our mine in July, 1950. It was operated daily during August, but since then only part-time —September, 8 shifts; October, 12 shifts; November, 2 shifts; December, 10 shifts; and January, 11 shifts. The two best days' performance were August 25 with seven holes drilled for a total of 417 ft, and January 25 with 10 holes and a total of 450 ft. The hole depths were 45 ft; temperature was 15-25 deg F.

This heavyweight Champion drill built by Joy Manufacturing Co. is 27 ft long and 11 ft, six in. wide, mast 38 ft. Electric power at 440 v is transmitted to the drill through a single 0000 wire cable, three wires for power, one for safety ground. It requires one bank of three single transformers 75 kva each. Crawlers which were 16 in. on the drill put in at Enos have now been replaced by 32 in. ones, with larger and heavier axles. The total weight is approximately 24 tons. Three four-ft jacks, powered by a five-hp motor delivering up to 800 lb of hydraulic pressure, make it easy to level and operate the machine. Two of the jacks are at the front of the machine. The third is centered at the rear. The machine is levelled by the driller, inside the cab, simply by adjusting a separate valve for each jack being governed by latitudinal and longitudinal water levels, located directly in front of his controls.

Tramming speed of this drill ranges up to five mph. The 40-hp drill-motor provides power for tramming. The services of a tractor are frequently required to level off or remove small stumps and debris from the path of the drill. However, this probably is not in excess of tractor aid given other types of vertical drills.

How Air Drill Operates

A 500-cu ft compressor with a 125-hp motor is installed at the front of the machine. Pressurized air and suction combine to remove cuttings from the hole. This air blown down through the drill stem passes through a strainer before entering the orifices of the Hughes tri-cone bit. The purpose of this is to keep foreign particles from clogging the air passageways within the bit, and also free from the bit bearings. If in the process of drilling, it is noted that the compressor is not functioning uniformly, the bit should be removed and the strainer cleaned. This explains the purpose of the strainer at the top of the bit, and it should never be removed.

Air emerging at the bottom of the hole through three jets inside the bit serves three purposes—(1) it cools the bit; (2) it forces fine cuttings from between the bit and the wall of the hole; and (3) it blows rock chips out of the path of the bit, so that they do not have to be ground up. The air compressor is set to kick in at 85 psi, and off at 100 psi. The safety valve is set at 110 psi.

The volume of air required is 3000 linear fpm velocity in the annulus between the drill stem and the wall of the hole. When the size of the hole being drilled is increased, a change in air volume must be made in direct proportion to the change in annulus area, in order to maintain the air velocity required. No risk is involved as the hole size is reduced. The pressure on the air is equally as important as the volume of air. Extensive drilling tests in all types of conditions indicate that 80-85 psi gauge at the compressor, combined with proper volume and velocity, will assure desirable drilling efficiency.

Approximately 20 percent of the total air volume is directed through the bearings of the bits. The air enters the bearings through the ball race, where considerable turbulence is created, passing evenly over the balls and ball race and evenly over the rollers and roller race. From there it is exhausted around the periphery of the drill hole.

The velocity of the air leaving the air-jets in the drill on-bottom reaches 67,800 linear fpm. This instantly starts a violent agitation of all loosened cuttings which continue up the bore hole. This violent energy of air leaving the air-jets also serves to keep the cutter teeth clean. The cooling of this mass of air by expansion as it leaves the air-jets quickly dissipates the frictional heat induced while drilling, and keeps the temperature of the bit substantially below the critical point. Since the bearings in this type of bit are the critical element, the allowable weight on the bit is limited to from 4000-6000 lb per in. of diameter.

The drill has a steel plate hood-and-funnel suspended above the hole from the underside of the machine, and connected to it is a flexible hose running to a Roto-Clone dust collector which traps and collects the cuttings at the surface. This is built onto the side of the machine and is furnished by the American Air Filter Co., Inc., Louisville, Ky. It provides a suction for removing cuttings from the collar of the hole induced by an exhaust fan and a five-hp motor. Suction is much greater than the blowing pressure from the air jets. Chips and other coarse material are deposited continuously in a pile at one side of the machine. Fine cuttings are collected in an adjacent hopper and are dumped manually from time to time. The Roto-Clone is not put in operation until dry material is being cut by the bit; we have found it necessary and expedient in wet and spongy top soil to drill down six or eight ft, then pull out the tools and clean the reamer and bit. Otherwise, the hole is clogged and the air does not have a chance to blow out the cuttings.

Drill rods are available in 10 and 20-ft lengths. Enos has four 20-ft lengths and one 10-ft length. The first string consists of the bit reamer, one 10-ft rod, and one 20-ft rod, total of 33 ft. The reamer is an auger instrument, two ft in length with one in. flights used to size the hole and aid in the removal of the cuttings. The outside diameter of the reamer is one-eighth in. smaller than the tri-cone bit. The deepest hole drilled at Enos has been 71 ft but Joy engineers informed us that holes up to 200 ft are being drilled in quarry work.

Drill feed through the centrally located rotary table is hydraulic through twin cylinders, with continuous rotary pressure cutting, and high speed retraction by means of an automatic chuck. The rotation of the tri-cone bit under terrific pressure produces a chipping action, instead of grinding, as one might think. The rotation is secondary to pressure. The top rotating feed is 80 rpm; three other speeds are available—approximately 50, 30, and 10 rpm. The top soil must be drilled very slowly and with very little pressure; the gauge indicator reads around 500 for top soil, 550-600 for shale and sandstone, and 625-700 for limestone.

Tri-cone rock bits of 6¾ in. and 7⅞ in. diam have been used at Enos. The description and performance are shown in the table above.

Drilling design and progress has lagged far behind the engineering of modern draglines and shovels. This new principle of air drilling may approximate the difference. It is not perfect. But wonderful results have been accomplished.

TRI-CONE BIT PERFORMANCE

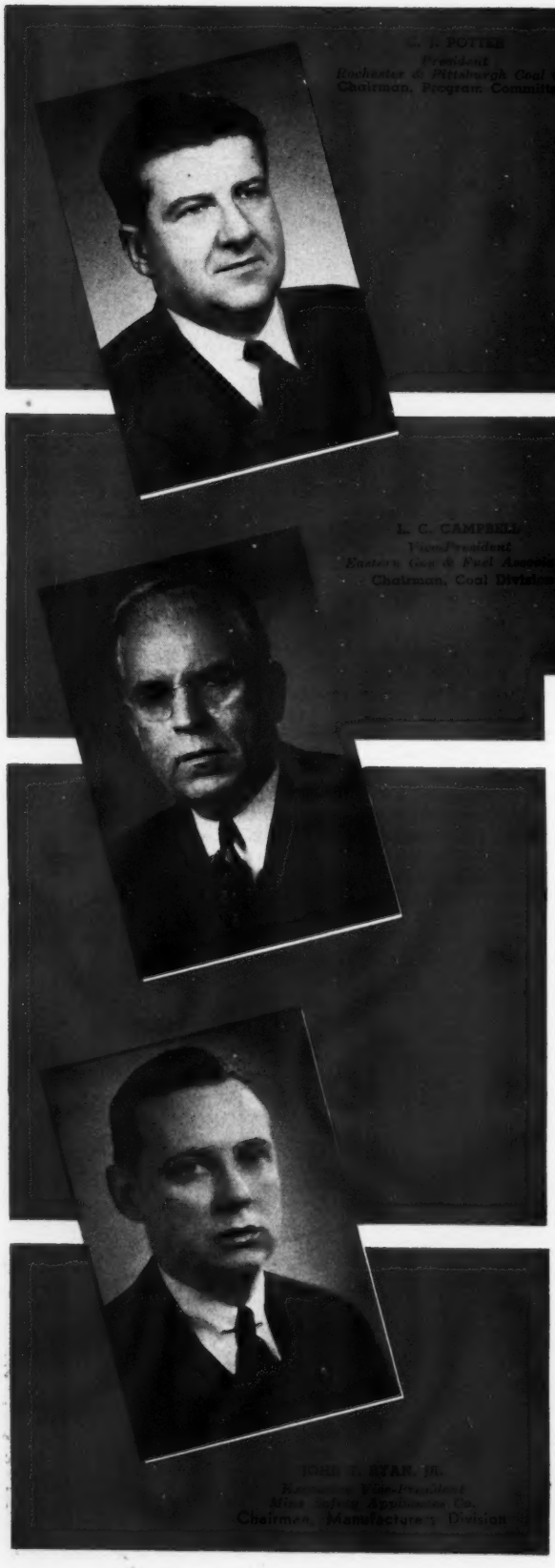
	Serial Type	Footage
1st bit—6¾ in	OSC	5008
2nd bit—6¾ in	OWC	5774
3rd bit—7⅞ in	OWC	6600
4th bit—6¾ in	OWC	6468

The 3rd bit 7⅞ in. OWC drilled very little lime.

SUMMARY

	Aug., 1950	Jan., 1951
Shifts worked (6¾ hrs. drilling time)	23	11
Holes drilled	130	75
Total footage	7094 ft.	3538 ft.
Average hole depth	54.57 ft.	47.17 ft.
Percent activity	80%	83.07
Ft./hr. drilled	53.24	53.40
Average footage per shift	308.43 ft.	321.64 ft.
Bit cost per foot—approximate	.02 to .025	
Power cost per shift—approximate	$5.00	
Total cost per foot—approximate	.16 (Direct mine costs only)	

Coal shovel with 5-cu-yd bucket loads 25-ton semi-trailer



Nation's Fuel Needs To Be Theme of 1951 Coal Show

"COAL IS DEFENSE" will be the theme of the Convention and Exposition of the American Mining Congress at Cleveland's Public Auditorium May 14-17. These four days will be devoted to penetrating analyses of current problems and of means whereby coal may continue to do its part in defense production and in supporting the nation's economy at this critical time. Emphasis will be laid on improved equipment and operating techniques to permit sustained efficiency and high production of quality fuels to meet all demands.

Comprehensive Program Scheduled

To carry out the theme of the meeting an energetic and effective program committee under the leadership of Dr. C. J. Potter, president of the Rochester & Pittsburgh Coal Co., has arranged a brilliant program. Able experts in their respective fields of coal mining, preparation, marketing and utilization have

prepared, for those attending the Convention, numerous papers presenting the latest and best ideas in the industry. No Convention sessions have been scheduled for Monday morning or Thursday afternoon, to allow uninterrupted inspection of the comprehensive exhibits.

On Monday afternoon, May 14, the Convention will open with a single session devoted to National Defense and Public Relations. A prominent speaker will sound the keynote in a talk on Coal and National Defense. This will be followed by talks on personnel relations, employe communications and mining community activities.

Tuesday morning there will be two concurrent sessions. One will cover coal preparation and the other maintenance and power. The former will comprise a round table on preparation problems and their solutions and will include discussion of wet cleaning of fine coal, common practices in air-clean-

HOWARD I. YOUNG
President
American Zinc, Lead & Smelting Co.
President, American Mining Congress

May 14-17 are "red letter" days for mining men interested in better, safer, and more efficient operation of their mines and plants. The 1951 Coal Show of the American Mining Congress, to be held in Cleveland on those dates, will bring together the greatest aggregation of modern mining machinery and equipment ever assembled—pointing the way to improvements in every phase of underground and surface operations. A splendid convention program will be presented, bringing into focus the problems imposed by a defense economy. Thousands of coal mining men from all sections of the country, together with many from the metal and nonmetallic mineral mines, will be on hand for this great educational event. You are cordially invited to attend.

Howard I. Young

Advance registration which proved so popular in 1949 will be used again this year. A perforated card is sent to each man registered by an exhibitor or operating company. When this card is presented at the door of the Exposition Hall, to gain admittance, one section will be detached and used for the registration record. The other section, with the registrant's name hand-printed in large "box car" letters, will be inserted in a regular badge holder and returned to the visitor for attaching to his lapel.

Of course, facilities will also be provided for current registration but valuable time will be saved through registration in advance.

ing, recent developments in coarse coal cleaning, cleaning small sizes of anthracite and related problems of mechanical waste disposal. The second session, on maintenance and power, will begin with a paper on planning for preventive maintenance, followed by underground maintenance organization, lubrication of mining equipment, the economics of automatic centralized lubrication and comparison of ac and dc power systems for underground mines.

A session dealing with strip mining, on Tuesday afternoon, will feature a symposium on overburden drilling. Different phases of this important part of overburden preparation will be treated in papers on compressed air in vertical drilling, selective-elevation horizontal drilling, overburden preparation in two-seam stripping and other developments in the field.

Mechanical mining will be the topic of a Wednesday morning operating session. Under this general subject are listed addresses on loading with bridge conveyors, trackless mining in 30-in. coal, main entry development in low coal and mechanical mining in anthracite. Another session Wednesday morning will deal with the all-important subject of Safety. Papers to be presented will cover protection against electrical hazards in coal mining, pulmonary diseases as related to the coal industry, advances in illumination underground and a discussion of the

Maurice D. Cooper
Chairman,
Floor Committee

Session Chairmen

M. H. Forester
Pittsburgh Consolidation Coal Co.

T. G. Gerow
West Virginia Coal & Coke Corp.

C. A. Gibbons
Susquehanna Collieries Div. M. A. Hanna Co.

J. L. Hamilton
Island Creek Coal Co.

G. S. Jenkins
Consolidated Coal Co.

K. L. Konnerth
U. S. Steel Co.

George H. Rupp
Colorado Fuel & Iron Corp.

R. H. Swallow
Ayrshire Collieries Corp.

permissibility of the Diesel-locomotive for coal mining.

A symposium on continuous mining machines will be featured Wednesday afternoon. Operators and manufacturers will join in describing units now in use. Conditions and mining plans under which they are applicable and the results obtained will be discussed by a group of experts. A paper on the use of the continuous miner to drive a slope is scheduled at this session and another on coordinating the auxiliary operations of continuous mining such as haulage, roof support, waste handling, power, maintenance and ventilation.

J. Ray Ulrich
Chairman
Welcoming Committee

While the continuous mining session is going on, a second strip mining program will be dealing with the topic of torque converter applications to off-the-highway haulage in coal strippings and how this new device affects the efficiency of the operation. Also scheduled for this session is a paper on the application of large augers to high-wall mining and a report by the Land Use Committee on stripped land reclamation.

Thursday morning's program will feature a talk on problems of industrial mobilization. This will be followed by a review and forecast of research for future uses of coal, a paper dealing with new developments in coal burning locomotives and one on the high combustion efficiency of the new "cyclone" furnaces.

One of the most important obstacles faced by manufactur-

(Continued on page 57)

Program Committee

E. M. Arentzen
Lee-Norse Co.

David T. Beals III
Crowe Coal Co.

Wm. Boury
Algoma Coal & Coke Co.

E. R. Bixby
Bixby-Zimmer Engr. Co.

W. A. Borries
Dawson Collieries, Inc.

Nelson L. Davis
Nelson L. Davis Co.

E. A. Dierks
Glen Alden Coal Co.

W. L. Doolittle
Consolidation Coal Co.
(W. Va.)

T. E. Forman
Mt. Olive & Staunton
Coal Co.

R. D. Foster
Goodyear Tire & Rubber Co.

J. H. Fulford
Jeffrey Mfg. Co.

C. A. Gibbons
Susquehanna Collieries Div.
M. A. Hanna Co.

Wm. E. Goodman
Goodman Mfg. Co.

C. A. Hamill
Sycamore Coal Co.

A. G. Heers
Kaiser Co., Inc.

A. K. Hert
Snow Hill Coal Corp.

E. M. Houston
Bucyrus-Erie Co.

J. P. Horne
Jewell Ridge Coal Corp.

S. B. Johnson, Jr.
Loram Coal & Dock Co.

J. M. Kerr
Berwind-White Coal
Mining Co.

R. E. Kirk
Tenn. Coal, Iron & RR Co.

Frank E. Mueller
Roberts & Schaefer Co.

J. T. Parker
Inland Steel Co.

C. A. Peterson
Northwest Mining &
Exchange Co.

F. S. Pfahler
Superior Coal Co.

E. M. Platts
Jay Mfg. Co.

H. A. Reid
United Electric Coal Cos.

H. C. Rose
Pittsburgh Coal Co.

A. J. Ruffini
North American Coal Corp.

John T. Ryan, Jr.
Mine Safety Appliances Co.

J. H. Sanford
Ohio Brass Co.

L. C. Schraub
Union Wire Rope Corp.

C. C. Seasonich
Lewis Foundry & Mine
Car Co.

Van B. Seib
Amherst Coal Co.

R. H. Swallow
Ayrshire Collieries Corp.

L. J. Walker
Chicago Pneumatic Tool Co.

J. William Walter
Peckhill Coal Co.

Frank White
Peabody Coal Co.

H. E. Wickey
Pocahontas Coal &
Coke Corp.

P. T. Williams
Pottsville, Pa.

W. A. Wilson
Electric Electric Co.

T. A. Workman
West Virginia Coal &
Coke Corp.

Wm. P. Young
Red & Seiler Coal &
Mfg. Co.

★ Program ★

Monday, May 14

2:00 P. M.—NATIONAL DEFENSE—PUBLIC RELATIONS

Chairman: C. J. POTTER, President, Rochester and Pittsburgh Coal Co.; Chairman, Program Committee.

Coal and National Defense
Speaker to be announced.

Public Relations in the Anthracite Industry
F. W. EARNEST, JR., President, Anthracite Institute.

Employe Communications
GEORGE VAN HAGEN, Dir. Personnel, Peabody Coal Co.

Mining Community Activities
J. E. ELKIN, Gen. Supt., Duquesne Light Co.

Tuesday, May 15

10:00 A. M.—COAL PREPARATION

Chairman: C. A. GIBBONS, Vice-President, Susquehanna Collieries Division, The M. A. Hanna Co.

Wet Cleaning Fine Coal
BYRON BIRD, Technical Consultant, Jeffrey Mfg. Co.

Current Practices in Air Cleaning
W. C. MCCULLOCH, Manager, Coal Preparation, Roberts & Schaefer Co.

Recent Developments in Coarse Coal Cleaning
DAVID R. MITCHELL, Head, Dept. of Mineral Engineering, Penn State College.

Cleaning Small Sizes of Anthracite
JAMES HANNIGAN, Supt. of Prep., Glen Alden Coal Co.

Related Problems of Mechanical Coal Cleaning
F. P. CALHOUN, Rochester & Pittsburgh Coal Co.

10:00 A. M.—MAINTENANCE AND POWER

Chairman: K. L. KONNERTH, Vice-President, Coal Division, U. S. Steel Co.

Planned Preventive Maintenance
W. E. WOLFE, Plant Supt., National Electric Coil Co.

Underground Maintenance Organization
WM. MCGREGOR, Chief Electrician, West Kentucky Division, Bell & Zoller Coal & Mng. Co.

Lubrication of Mining Equipment
V. O. MURRAY, Gen. Mgr., Union Pacific Coal Co.

The Economics of Automatic Centralized Lubrication of Coal Mining Machinery
L. W. DEUTSCH, Sales Mgr., Trabon Engineering Corp.
J. B. ANDERSON, Supervising Engineer, The Texas Co.

Comparison of AC and DC Systems for Underground Mines
J. Z. LINSENMEYER and A. G. OWEN, Westinghouse Electric Corp.

2:15 P. M.—ROOF SUPPORT

Chairman: G. S. JENKINS, Vice-President, Consolidated Coal Co.

Roof Bolting with Large Mobile Equipment
JOHN K. BERRY, Prod. Engr., Consolidation Coal Co. (Ky.)

Roof Bolting in Thin Seams with Portable Equipment
C. E. HOUGH, Vice-President, Imperial Smokeless Coal Co.

Geological Considerations in Roof Bolting
PAUL H. PRICE, State Geologist, and
A. T. CROSS, Geologist, West Virginia Geological Survey.

Roof Bolting with Dust Control Equipment
JAMES WESTFIELD, Chief, Accident Prevention and Health Division, District VIII, U. S. Bureau of Mines.

Combined Coal Drill and Timber Setting Machine
CLARENCE M. HAYS, Division Engineer, Pittsburgh Coal Co.

2:15 P. M.—STRIP MINING

Chairman: R. H. SWALLOW, Chief Engineer, Ayrshire Collieries Corp.

Overburden Preparation Featuring Compressed Air in Vertical Drilling
W. J. CRAWFORD, Vice-President, Enos Coal Mining Co.

MEET THE SPEAKERS
Pages 58-61

Selective Elevation Horizontal Drilling
DONALD D. SAXTON, Superintendent, Stripping Operations, Hanna Coal Co.

Other Late Developments in Overburden Drilling
GENE H. UTTERBACK, Chief Engineer, United Electric Coal Cos.

Drilling and Blasting in Two-Seam Stripping
RUSSELL BADGETT, JR., Secretary, Badgett Mine Stripping Corp.

2:00 P. M.—MANUFACTURERS DIVISION MEETING

Including discussion of materials procurement problems

Wednesday, May 16

10:00 A. M.—MECHANICAL MINING

Chairman: J. L. HAMILTON, Vice-President, Island Creek Coal Co.

Mechanical Loading with Bridge Conveyors
A. B. CRICHTON, JR., Vice-President, Johnstown Coal & Coke Co.

Trackless Mining in 30-Inch Coal
IRVIN C. SPOTTE, Princess Elkhorn Coal Co.

Main Entry Development in Low Coal
W. D. HAWLEY, General Superintendent, Eastern Gas & Fuel Associates.

Mechanical Mining in Anthracite
E. F. YOUNG, Mining Engineer, Philadelphia & Reading C. & I. Co.
W. I. STONEBRAKER, Colliery Superintendent, Hudson Coal Co.

10:00 A. M.—SAFETY

Chairman: GEORGE H. RUPP, Mgr. Mining Dept., Colorado Fuel & Iron Corp.

Protection Against Electrical Hazards in Coal Mining
GEORGE C. BARNES, Professor, Virginia Polytechnic Institute.

Pulmonary Diseases as Related to Coal Mining
DR. A. J. VORWALD, Director, Trudeau Foundation.

Advances in Illumination for Coal Mines
G. F. PRIDEAUX and C. M. CRYSLER, General Electric Co.

Permissibility of Diesel Locomotives for Coal Mining
J. H. EAST, JR., Regional Director, U. S. Bureau of Mines.

10:00 A. M.—PURCHASING AGENTS' ROUND TABLE

Discussion leaders to be announced.

2:15 P. M.—CONTINUOUS MINING

Chairman: M. H. FORESTER, Vice-President, Pittsburgh Consolidation Coal Co.

Symposium of Machines and Operating Methods

The Mining Development Committee and Continuous Mining
GERALD VON STROH, Director, Mining Development Committee, Bituminous Coal Research

The Joy Continuous Miner:
A. LEE BARRETT, Research Engineer, Joy Mfg. Co.

The Goodman Mining and Loading Machine:
M. F. CUNNINGHAM, Vice-Pres., Goodman Mfg. Co.

The Lee-Norse Koal-Master:
E. M. ARENTZEN, President, Lee-Norse Co.

The Jeffrey Colmol:
W. J. PHILLIPS, Sunnyhill Coal Co.

Coordinating the Auxiliary Operations
H. B. WICKEY, Vice-President, Pennsylvania Coal & Coke Corp.
T. L. AITKEN, Vice-President, Ebensburg Coal Co.

Slope Driving with a Continuous Machine
H. A. TREADWELL, Vice-President, Chicago, Wilmington & Franklin Coal Co.

2:15 P. M.—STRIP MINING

Chairman: T. G. GEROW, President, West Virginia Coal & Coke Corp.

Torque Converters in Strip Mine Haulage Units
R. M. SCHAEFER, Allison Div., General Motors Corp.

Large Augers for Highwall Mining
CHARLES E. COMPTON, President, Grafton Coal Co.
D. M. BONDURANT, Assistant Professor of Mining Engineering, West Virginia University.

Stripped Land Use Developments
Discussions by Members of Land Use Committee.

Thursday, May 17

10:00 A. M.—INDUSTRY MOBILIZATION-COAL UTILIZATION

Chairman: L. C. CAMPBELL, Vice-President, Eastern Gas & Fuel Associates; Chairman, Coal Division, American Mining Congress.

Problems of Industrial Mobilization
ARNOLD LEVY, Counsel, Coal Defense Committee.

Research for Future Uses of Coal
DR. A. A. POTTER, Pres., Bituminous Coal Research.

New Developments in Coal Burning Locomotives
GEORGE D. CREELMAN, Director of Research, M. A. Hanna Co.

Cyclone Furnace Develops High Efficiency
MERLE NEWKIRK, Power Manager, Dow Chemical Co.

Allen-Sherman-Hoff Pump Co.
*Allis-Chalmers Mfg. Co.
Alloy Steel & Metals Co.
*American Brake Shoe Co.
American Brattice Cloth Corp.
*American Car & Foundry Co.
American Chain & Cable Co., Inc.
*American Cyanamid Co.
American Mine Door Co.
Anaconda Wire & Cable Co.
Armstrong Coalbreak Co.
*Atlas Powder Co.

Baker-Raulang Co.
Barber-Greene Co.
Bixby-Zimmer Engineering Co.
Bowdil Co.
Broderick & Bascom Rope Co.
*Brown-Fayro Co.
Bucyrus-Erie Co.

Cambridge Machine & Supply Co.
Carboloy Co., Inc.
Card Iron Works Co., C. S.
Cardox Corp.
Caterpillar Tractor Co.
*Central Frog & Switch Co.
Central Mine Equipment Co.
Centrifugal & Mechanical Industries, Inc.
Chicago Pneumatic Tool Co.
Cincinnati Mine Machinery Co.
Cities Service Oil Cos.
Clarkson Mfg. Co.
Colorado Iron Works Co.
Continental Gin Co., Industrial Div.
Crucible Steel Co. of America

* Charter Members.

D-A Lubricant Co., Inc.
Deister Concentrator Co.
Differential Steel Car Co.
Dow Chemical Co., Great Western Div.
Duff-Norton Mfg. Co.
*Du Pont de Nemours & Co., Inc., E. I.

*Edison, Inc., Thomas A.
Eimco Corp.
Electrical Steel Foundry Co.
Electric Storage Battery Co.
*Elreco Corp.
Ensign Electric & Mfg. Co.
*Enterprise Wheel & Car Corp.
Euclid Road Machinery Co.

Fairmont Machinery Co.
Farmers Engineering & Mfg. Co.
Firestone Tire & Rubber Co.
Flood City Brass & Electric Co.

Gardner-Denver Co.
*General Electric Co.
*Goodman Mfg. Co.
Goodrich Co., B. F.
Goodyear Tire & Rubber Co.
Gorman-Rupp Co.
Gould-National Batteries, Inc.
Gruendler Crusher & Pulverizer Co.
Guyan Machinery Co.

Harnischfeger Corp.
Helmick Foundry-Machine Co.
*Hendrick Mfg. Co.
Hendrix Mfg. Co., Inc.
*Hercules Powder Co.
Hewitt-Robins Incorporated
Heyl & Patterson, Inc.
*Hockensmith Corp.
*Holmes & Bros., Inc., Robert
*Hulburt Oil & Grease Co.

Independent Pneumatic Tool Co.
Ingersoll-Rand Co.
International Nickel Co., Inc.

Interstate Equipment Div., Yara Engrg. Co.
Irwin Foundry & Mine Car Co.
*I-T-E Circuit Breaker Co.

*Jeffrey Mfg. Co.
Johnson-March Corp.
*Joy Mfg. Co.

Kanawha Mfg. Co.
Kansas City Structural Steel Co.
Kensington Steel Co.
Koehler Mfg. Co.

LaBour Co., Inc.
Lee-Norse Co.
LeRoi Co., Cleveland Division
*Leschen & Sons Rope Co., A.
*Link-Belt Co.
Long Super Mine Car Co.
Longyear Co., E. J.
Ludlow-Saylor Wire Co.

*McGraw-Hill Publishing Co.
McLanahan & Stone Corp.
*McNally-Pittsburg Mfg. Corp.

Mack Motor Truck Corp.
Macwhyte Company
Marion Power Shovel Co.
Mechanization, Inc.
*Mine Safety Appliances Co.
Mine & Smelter Supply Co.
Mining Machine Parts, Inc.
Mosebach Electric & Supply Co.
Mott Core Drilling Co.
Murphy Diesel Co.
*Myers-Whaley Co.

National Electric Coil Co.
National Malleable & Steel Castings Co.
National Mine Service Co.
Nordberg Mfg. Co.

*Ohio Brass Co.
Ohio Oil Co.
Okonite Co., Hazard Ins. Wire Wks. Div.
Oliver Iron & Steel Corp.
Osmose Wood Preserving Co. of America

Pacific Foundry Co., Ltd.
Page Engineering Co.
Paris Mfg. Co.
Pattin Mfg. Co.
Penn Machine Co.
Peterson Filters & Engineering Co.
*Phillips Mine & Mill Supply Co.
Pittsburgh Gear Co.
Post-Glover Electric Co.
Precision Chain Co.
Productive Equipment Corp.
Prox Co., Inc., Frank

Quaker Rubber Corp.

Raybestos-Manhattan, Inc.
Reliance Electric & Engineering Co.
*Roberts & Schaefer Co.
*Roebling's Sons Co., John A.
Rome Cable Co.

Safety First Supply Co.
Salem Tool Co.
Schroeder Bros.
Sheffield Steel Corp.
*Simplex Wire & Cable Co.
Simplicity Engineering Co.
*S K F Industries, Inc.
Southwestern Engineering Co.
Sprague & Henwood, Inc.
Stearns-Roger Mfg. Co.
Stephens-Adamson Mfg. Co.
Sterling Steel Casting Co.
Sun Oil Co.

Tamping Bag Co.
Templeton, Kenly & Co.
Texas Co.
*Timken Roller Bearing Co.
Tool Steel Gear & Pinion Co.
Traylor Engineering & Mfg. Co.
*Tyler Co., W. S.

Ultra-Violet Products, Inc.
Union Iron Works
Union Wire Rope Corp.
*United Engineers & Constructors, Inc.
U. S. Rubber Co.
*U. S. Steel Co.

Vulcan Iron Works Co.

Wedge Wire Corp.
*Weir Kilby Corp.
Western Cartridge Co.
Western Machinery Co.
*Westinghouse Electric Corp.
West Steel Casting Co.
West Virginia Steel & Mfg. Co.
Worthington Pump & Machinery Corp.

ers and suppliers of mining and preparation equipment is the difficulty of obtaining steel, rubber, copper and other production materials now in short supply or subject to government control. On Tuesday afternoon the Manufacturers Division will learn what steps have been taken and what plans are being made to remove the road blocks to full production.

A special Purchasing Agents' Round Table on Wednesday afternoon will consider the questions of procurement of equipment and operating, repair and replacement materials in quantities sufficient to insure continued safe and efficient functioning of the country's coal mines.

Greatest Equipment Display Ever

A list of the companies exhibiting at the 1951 Coal Show is a roster of the leading manufacturers and suppliers of equipment and op-

(*Continued on page 61*)

CONVENTION SPEAKERS

National Defense Public Relations

Monday Afternoon

F. W. Earnest, Jr.
Anthracite Institute

George Van Hagen
Peabody Coal Co.

J. E. Elkin
Duquesne Light Co.

Coal Preparation

Tuesday Morning

Byron Bird
Jeffrey Mfg. Co.

William McCulloch
Roberts & Schaefer Co.

David R. Mitchell
Pennsylvania State College

James Hannigan
Glen Alden Coal Co.

E. P. Calhoun
Rochester & Pittsburgh Coal Co.

Maintenance and Power

Tuesday Morning

W. E. Wolfe
National Electric Coil Co.

Wm. McGregor
Bell & Zoller Coal & Mining Co.

V. O. Murray
Union Pacific Coal Co.

L. W. Deutsch
Trabon Engineering Corp.

J. B. Anderson
The Texas Co.

J. Z. Linsenmeyer
Westinghouse Electric Corp.

A. G. Owen
Westinghouse Electric Corp.

Roof Support

Tuesday Afternoon

John K. Berry
Consolidation Coal Co. (Ky.)

C. E. Hough
Imperial Smokeless Coal Co.

Paul H. Price
West Virginia Geological Survey

A. T. Cross
West Virginia Geological Survey

James Westfield
U. S. Bureau of Mines

Clarence M. Hays
Pittsburgh Coal Co.

Strip Mining

Tuesday and Wednesday Afternoons

W. J. Crawford, III
Enos Coal Mining Co.

Donald D. Saxton
Hanna Coal Co.

Gene H. Utterback
United Electric Coal Cos.

(*Photo not available*)

Charles E. Compton
Grafton Coal Co.

D M. Bondurant
West Virginia University

R. M. Schaefer
Allison Division, General Motors Corp.

Russell Badgett, Jr.
Badgett Mine Stripping Corp.

Safety

Wednesday Afternoon

George C. Barnes, Jr.
Virginia Polytechnic Institute

G. F. Prideaux
General Electric Co.

(*Photo not available*)

A. J. Vorwald
Trudeau Foundation

C. M. Crysler
General Electric Co.

J. H. East, Jr.
U. S. Bureau of Mines

Mechanical Mining

Wednesday Morning

A. B. Crichton, Jr.
Johnstown Coal & Coke Co.

Irvin C. Spotte
Princess Elkhorn Coal Co.

W. D. Hawley
Eastern Gas & Fuel Associates

Elmer F. Young
Phila. & Reading Coal & Iron Co.

W. I. Stonebraker
Hudson Coal Co.

Gerald von Stroh
Bituminous Coal Research, Inc.

A. Lee Barrett
Joy Mfg. Co.

Continuous Mining

Wednesday Afternoon

M. F. Cunningham
Goodman Mfg. Co.

(Photos not available)

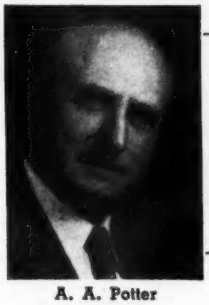
T. L. Aitken
Ebensburg Coal Co.

H. B. Wickey
Pennsylvania Coal & Coke Corp.

E. M. Arentzen
Lee-Norse Co.

W. J. Phillips
Sunnyhill Coal Co.

H. A. Treadwell
Chicago, Wilmington & Franklin Coal Co.



A. A. Potter
Bituminous Coal Research, Inc.

Industry Mobilization—Coal Utilization

Thursday Morning

(Photo not available)
Arnold Levy
Coal Defense Committee

G. D. Creelman
M. A. Hanna Co.

Merle Newkirk
Dow Chemical Co.

erating necessities for the mining industry. Coal miners, metal and non-metallic mining men alike will welcome this opportunity to see the latest and best developments in machines, equipment and supplies. A complete, careful inspection of the exhibition halls and main floor of the Auditorium will reveal more than could be seen in a lifetime spent in the field. Under the chairmanship of J. T. Ryan, Jr., executive vice-president of Mine Safety Appliances Co., the Manufacturers Division has gathered every type of equipment applicable to deep and strip mining, loading, haulage, cleaning and preparation. On pages 63 through 80 of this issue will be found brief descriptions of each of the displays, which will occupy more than 117,000 sq ft of floor space.

Many of the products will be introduced to the mining world for the first time at this greatest of all Coal Shows. Representatives of the exhibiting companies will be on hand to discuss and explain the applications and operating features of each item displayed.

On the Lighter Side

Coal Show week has always been a time for getting together with old friends and making new ones. Many tons of coal have been "mined" at the various entertainment functions and more informal gatherings. This

AMC Staff

Julian D. Conover
Secretary

A. W. Dickinson
Legislation

P. D. McMurrer
Assistant to Secretary

Harry L. Moffett
Publicity

William I. Powell
Taxation

G. B. Southward
Mechanization Engineer

John C. Fox
Editor
Mining Congress Journal

Ralph Duysters

Frank Moran

Field Representatives—Mining Congress Journal

year Wednesday evening, May 16, has been set aside for a regularly scheduled entertainment, while the other evenings, Monday, Tuesday and Thursday, have been left free for private parties and visiting.

For the Wednesday evening event, the Fred Waring Show has been engaged for a special appearance. This world-famous organization, in addition to Fred Waring and his Pennsylvanians, includes such featured attractions as the Glee Club, Jane Wilson, Joanne Wheatley, Daisy Bernier and "Stu" Churchill.

Ladies who plan to attend the 1951 Coal Show are urged to register as soon as possible after arrival, either in person or by telephone at Ladies' Headquarters in the Hotel Cleveland. A special entertainment program has been planned for each day.

Come to Cleveland's Public Auditorium on May 14-17—four memorable, valuable

Fred Waring and his world-famed organization will entertain convention-goers and their guests on Wednesday evening

days. See the exhibits of the newest in coal mining and preparation machinery and equipment. Discuss these innovations with the experts in attendance. Learn how the problems in mining, cleaning, marketing and utilization of coal have been solved and what is afoot to insure the industry's fullest participation in defense plans during the days and years ahead. Meet old friends and make new ones in the friendly atmosphere for which the Coal Show is famous. Enjoy the music and songs provided by the cream of the entertainment world. In short, attend the American Mining Congress 1951 Coal Convention and Exposition.

• THIS is the preview of the greatest Coal Show ever. All of the exhibitors, whose displays will cover the more than 117,000 sq ft in the five exhibition halls and the main floor of the Arena, will have representatives on hand to discuss your problems and render assistance. To make your visit to the Coal Show in Cleveland's Public Auditorium pay the biggest dividends, examine the exhibits carefully and talk things over with the experts.

• ACME MACHINERY CO.

Builders of mine car compressors, spray cars, both track and rubber-tired, and mining equipment will feature in their display, an entirely new line of portable mine air compressors. These are marked by high capacity, low over-all height, compactness and durability. They will be two-stage air-cooled, available on rubber tires or track mounted; self-propelled or non-propelled and skid-mounted models. Also on display will be a new jumbo equipped with long-feed drifter drills. *In charge—Matison Evans.*

• AEROQUIP CORP.

Will display Aeroquip flexible hose lines suitable for most low, medium and high pressure applications. The lines are equipped with Aeroquip detachable and reusable fittings easily assembled "right on the spot," a distinct advantage in coal mines where large expensive equipment is used far from repair shop.

Cutaway views of the Aeroquip self-sealing coupling will show how its internal structure permits connecting and disconnecting flexible hose lines with no loss of fluid or inclusion of air.

Of added interest will be a large pictorial display showing Aeroquip products installed on equipment at the exhibition. *In charge—R. C. Colyer, M. W. Brandau, H. L. Schrock, Jr.*

• AERO SERVICE CORP.

To show the economies possible with aerial mapping of strip mining properties the exhibit will feature photo-reconnaissance and topographic maps along with a new method for inventorying fuel stockpiles from the air. This new method, accurate within three-five per cent, is done for three-fourths the cost of ground surveys. Makes possible a single inventory date for large stripping or stockpile areas. The aerial contour maps, made at savings of 25 per cent and more for the mining industry, can be used to estimate coal acreage, delineate crop lines, plot bore

holes, locate spoil dumps, lay out roads and rail spurs, compute overburden and plot property boundaries. *In charge—George L. Hess.*

• **AHLBERG BEARING CO.**

On display will be a wide range of sample bearings for convention visitors to handle and examine. Also featured and of interest to cost-conscious engineers, will be the Ahlberg line of X-change bearings which, the company states, saves about 40 percent in bearing replacement costs. A full line of precision ball bearings and mounted units applicable to the mechanized coal industry will be the dominant theme of this display. *In charge—M. G. McGregor and Robert L. Schutte.*

• **ALAN WOOD STEEL CO.**

Is featuring A. W. Algrip the only abrasive impregnated rolled steel floor plate made anywhere in the world. Aluminum oxide abrasive grain is rolled as an integral part of the upper portion of the plate and provides nonslip footing.

Visitors to the convention will be permitted to test for themselves the secure footing afforded by Algrip on a 30° ramp.

Practical applications of this material will be on display and samples and literature will be available for those interested. *In charge—L. J. Lieberman.*

• **ALEMITE DIVISION, STEWART-WARNER CORP.**

Will show accumeter centralized lubrication systems for handling fluid or grease lubricants. This new type system is just now reaching the market. Also on display will be various transfer or pumping equipment for barrel to bearing lubricant handling. *In charge—E. Ralph Harris.*

• **ALLEN-SHERMAN-HOFF PUMP CO.**

Will display, for the first time, the new Frame AB Hydroseal Pump which incorporates a radical change in design over previous models. Included in the exhibit will be the mechanical structure around which can be built either the new Frame AB pump of the 3 in. or the Frame A Hydroseal Pump of the 2 in. size, illustrating interchangeability of the parts. *In charge—W. M. Walters.*

• **ALLIED CHEMICAL & DYE CORP.**
Solvay Sales Division

Will feature the use of Solvay calcium chloride for the treatment of coal to allay dust or inhibit freezing. *In charge—George P. Spencer.*

• **ALLIS-CHALMERS MFG. CO.**
General Machinery Division

The features of this display will be a car shaker, for unloading coal from hopper-bottom gondola cars, screens, pumps and motors.

In operation will be a 5 by 12 ft "Ripl-Flo" screen and a one-quarter size model of a 10 by 8-in. solids pump with automatic "Texrope" drive demonstrating difference in capacity and pump rpm through adjusting the "Texslide" motor base while the drive is in motion.

Other interesting items of equipment will be a "Low-Head" screen, a rubber-lined slurry pump, a close coupled "Electrifugal" pump, a 150-hp tube-cooled motor, a cutaway of a totally-enclosed fan-cooled motor and an exploded version of a large solids handling pump.

In attendance will be 25 representatives. *In charge—P. F. Bauer.*

• **ALLIS-CHALMERS MFG. CO.**
Tractor Division

Will show a completely new and modern line of crawler tractors HD-5, HD-9, HD-15 and HD-20. Baker, Tractomotive and Gar Wood are joining the exhibit by fitting these machines with their best mounted and drawn equipment for stripping and material handling. Outstanding in the exhibit will be the giant HD-20G, the world's largest crawler tractor fitted with a 4-cu-yd front end shovel. The Model D motor grader champion road maintenance unit, with a utility rearend loader will also attract much interest. *In charge—H. J. Masuhr, Jr.*

• **AMERICAN AIR FILTER CO., INC.**

Propose a display of dust collectors and air filters. Working models of the type N Roto-Clone and type W Roto-Clone, both of which are wet-type dust collectors will be shown. The Cycoil oil-bath air cleaner and the CMS multi-duty automatic self-cleaning air filter will also be displayed. *In charge—John Kane.*

• **AMERICAN BRATTICE CLOTH CORP.**

For the first time exhibit their new Inflatable Brattice. The front of the display will simulate the inside of a coal mine with one of these collapsible brattices in place. This device solves a problem which has long perplexed mining men. It can be taken down merely by letting out the air and then used elsewhere when reinflated.

Mine ventilation tubing and ABC Jute Brattice cloth will also be displayed. *In charge—D. B. Mikesell.*

• **AMERICAN CAR & FOUNDRY CO.**

Besides a full-size drop-bottom mine car, one of several recently built for a new mine operation in West Virginia, ACF will feature a variety of its lubricated plug type valves at the exhibit. Included in the valve assortment, which are used in mine service, will be a mounted semi-steel valve with an air-operating automatic cylinder attached.

A color motion picture on ACF mine cars in use in various coal operations will also be shown. *In charge—F. J. Bogard.*

• **AMERICAN CHAIN & CABLE CO., INC.**
American Cable & Hazard Rope Divisions

Will have on display an exhibit of wire rope for coal mining. There will be in attendance a staff of eight ready to discuss wire rope problems with operating men. *In charge—W. W. Runkle.*

• **AMERICAN CYANAMID CO.**
Explosives Department

Will display pertinent information regarding coal preparation on surface featuring heavy-media separation. Proper use of explosives in face preparation will also form an important part of this display.

• **AMERICAN MANGANESE STEEL DIVISION**
American Brake Shoe Co.

Welding products, featuring a complete line of welding rod for hardfacing and repair, will constitute the exhibit at the Coal Show. The new tungsten-carbide rods, which are gaining wide usage in the coal fields, will be included. *In charge—Harry D. Sweeney.*

• **AMERICAN MINE DOOR CO.**

A track cleaner which cleans the haulway by removing hard packed material between rails and the gob on either

side to a width of 57 in. from the center of track at the rate of a ton a minute will form the nucleus of this display. The Little Chief Rock Duster with a winch which makes it possible for two men to place the machine on a belt conveyor, or take it off, will also be shown. The drum capacity of the winch on this unit is 140 ft of wire rope which can be wound at a travel speed of 40 fpm. When desired the Little Chief Rock Duster can be supplied with pneumatic tires and tubes. Other interesting parts of this exhibit will be the automatic switch thrower and derail, also a Mighty Midget Dustributor. *In charge—Charles Vignos.*

• AMERICAN STEEL FOUNDRIES

Will exhibit a mine car coupler, a tractor-trailer coupler and towed trailer axle with a unique level load principle.

The mine car coupler is the American industrial coupler for mine and industrial cars and locomotives. It permits coupling of cars and locomotives within a wide range of horizontal and vertical misalignment. Pull is transmitted entirely through cast steel contacts. Safety, speed, dependability and great strength are combined with simple, rugged design.

The tractor trailer coupler is the 36-in. ASF safety fifth-wheel for rugged service on or off the highway. In strip mines, quarry and other heavy hauling the Universal tilting action of the ASF fifth wheel eliminates twisting strain. The towed-trailer axle is the ASF-Linco "level load" trailer axle. Under uneven load placement, trailers equipped with this axle will not tip, tilt or sway. Helical springs and lever action give full springing action under light or heavy loads. *In charge—Edwin A. Parker.*

• ANACONDA WIRE & CABLE CO.

Presents a built-up display of five separate panels illustrating five applications of wire and cable in the mine. The first panel displays new shuttle car cable. The other four panels are made up of mine power cables, shovel cables and other similar wire and cable uses. Each panel is designed to give maximum up-to-date information quickly. *In charge—C. B. Peck.*

• ANDERSON MFG. CO., ALBERT & J. M.

Pow-R-Gard and Ground-Gard, entry-to-face electric power distribution systems providing automatic circuit-breaker protection for men and machines will be the featured display. The instanteous reaction of these units to short circuits, overloads and ground faults reduces personnel hazard and virtually eliminates serious damage to cable and equipment.

Equipment shown will be limited to permissible types for either high or low seam mining, although they are also manufactured in models suitable for non-gaseous mines. The equipment on display will be operable for circuit demonstration and portable to emphasize its minimum size and weight. *In charge—F. C. Messenger.*

• ARMCO DRAINAGE & METAL PRODUCTS, INC.

Will exhibit a full scale mine entry constructed of Armco liner plate. There will also be a working model to illustrate the water carrying capacity of Pipe-Arch as compared to round pipe.

Other items will include Steelox buildings, corrugated and spiral-welded pipe, bin walls, steel sheeting, Hel-Cor pipe and Flex-Beam guardrail as they apply in the coal mining industry. *In charge—W. H. Spindler.*

• ARMSTRONG-BRAY & CO.

Plan to exhibit their line of splices for heavy duty conveyor belting featuring the Hinged Plategrip belt fasteners and Plategrip repair plates for conveyor belts. *In charge—F. L. Bishop.*

• ARMSTRONG COALBREAK CO.

Plan an exhibit which will consist of a high pressure air compressor used to supply the air for airshooting equipment and one of the shells or airbreakers. The shell will be discharged at low pressures to illustrate its operation. The compressor will be cut away in several places to show its design. Valves and accessory equipment used in conjunction with airshooting will also be on display. *In Charge—L. L. Filstrup.*

• ASHLAND OIL & REFINING CO.

Is planning an extensive and interesting set of exhibits featuring Coal Spray and Mining Lubricants. Calling attention to use of the company's PERMATREAT Coal Spray and lubricants by mining companies will be a lighted turntable featuring translighted photos of mining operations and installations involving the use of these products.

A large map shows areas supplied and illustrates the strategic location of Ashland's supply points in relation to nearby coal fields. The other panels, one featuring Ashland Flying Octanes Gasoline and Valvoline Motor Oil and the other illustrating photographic backgrounds of refineries are shown. In addition, there is a unique moving display featuring Ashland products. *In charge—John L. Stewart, E. S. Bradbury.*

• ATLAS POWDER CO.

Rockmaster split-second delay blasting system for control of explosives force, giving better breakage of burden and control of throw with less noise and vibration will be the feature attraction of this exhibit. Machine-gun camera photos of blasts will illustrate advantages of Atlas blasting methods. The new Atlas adjustable blasting galvanometer and fluted-end cartridge designed for easy loading will also be on display. *In charge—John L. Romig.*

• AUSTIN POWDER CO.

Featuring a complete line of drilling tools adaptable to all types of rotary drills, this exhibit will also include a complete line of tungsten carbide cutting machine bits as well as drill bits. Another important part of the exhibit will be a newly developed type of detonating cord. This is a plastic coated water resistant all purpose fuse.

For strip mine work a recently developed type of tungsten carbide drill heads of six and nine in. diameters will also be shown. *In charge—Neil Baker.*

• BAKER-RAULANG CO.

Plan to exhibit the Baker-Fletcher roof drill and wrench for the first time, and to demonstrate it in operation.

A personnel car, designed expressly for low seam operation, will also be featured in this exhibit.

Those who visit the booth will be invited to a demonstration at the Baker factory of a coal-mine tractor and timbering machine. At this demonstration the visitor will have an opportunity to see other Baker-Raulang and J. H. Fletcher equipment in various stages of construction. *In charge—John R. Morrill.*

• **BALDWIN-LIMA-HAMILTON CORP.**

Lima-Hamilton Division

Against the background of large colored photographs of Lima shovels and draglines in open pit mines, will be shown a small working model which will be operated as a shovel and dragline. Lima shovels, built in capacities ranging from ¾-6 cu yd and variable dragline capacities will be covered in bulletins on all sizes and types available to anyone interested in excavating or loading equipment. *In charge—Roy Wills.*

• **BALTIMORE & OHIO RAILROAD CO.**

Will show their exhibit designed to promote the use of bituminous coal. The theme emphasizes the progress being made by the coal industry in mining and preparing bituminous coal and progress by coal burning equipment manufacturers in designing efficient, flexible burning units. An electrically animated panel will describe the many varieties of bituminous coal mined along the Baltimore & Ohio and locate producing fields. In addition, there will be "scene-in-action" displays showing cross sections of modern coal preparation systems and modern burning systems, both for large utility plants and smaller industrial plants. *In charge—G. C. Bauer.*

• **BARBER-GREENE CO.**

The principal item in this display will be the newly announced 366 portable mine conveyor.

Designed to provide follow-up haulage for continuous mining machines, the unit has a 24-in. belt and is 20 ft in length. Rubber tire mounted, and weighing 1600 lb it is well balanced for man-handling. This rugged, durable yet light weight portable conveyor can be used in easily connected series, with as many as 12 or 15 operating from a master switch. *In charge—Earl D. Stearns.*

• **BEARING SERVICE CO.**

In charge—Wm. F. Chase.

• **BEMIS BRO. BAG CO.**

Plan to exhibit a short length of Flexipipe ventilation tubing attached to a blower fan. *In charge—I. D. Teter.*

• **BETHLEHEM STEEL CO.**

Will exhibit a 17-ton mine car with a cast-steel truck, forged-steel wheels, a cushion draft gear and automatic couplers. Heavy-duty trackwork will be shown both actually and pictorially to point out the ease with which the various parts are installed. Mine roof bolt extensions—something new for mine roof-bolting in low seams—will be displayed. Wire rope for underground and surface mining as well as other items important to the mining field will round out the exhibit. *In charge—A. A. Warg.*

• **BIRD MACHINE CO.**

Will display the new Bird "Polisher," full size, with Lucite bowl to show interior construction and operation. The Polisher which is identical in construction with the Bird coal filter is designed to provide for maximum clarification of the cleaning water and the removal of extreme fines. All interested in coal preparation will want to see this Bird "Polisher," how it works and what it does. *In charge—George Sherrerd.*

• **BITUMINOUS COAL INSTITUTE**

No description available.

• **BITUMINOUS COAL RESEARCH, INC.**

Description not available.

• **BIXBY-ZIMMER ENGINEERING CO.**

Will exhibit two vibrators in operation equipped with Bixby-Zimmer screen, crown mounted. Feature attraction will be the new step-deck design on one vibrator used on dewatering and sizing. The other vibrator will be fitted with heavy duty screen at feed end to absorb wear and shock and balance of deck for dewatering. Also shown will be actual screens to show various types of framing and uses. All machinery will be in motion to display actual operating performance. *In charge—Ray Kaga.*

• **BLACKHAWK MFG. CO.**

Will exhibit hydraulic jacks with capacities up to 100 tons; wrenches and hand tools; hydraulic pipe benders and knockout punches. These products are used for a wide range of maintenance, repairing and rebuilding work.

Of special interest will be the remote controlled S-80 Porto-Power with a 50-ton capacity. This hydraulic jack gives full tonnage in any direction and can be used for lifting, pressing, straightening, bending and other operations in the maintenance of heavy machinery. Remote control which places the operator six ft from the lifting point is an additional safety feature on the S-80. A toe lift sleeve attachment with a capacity of 25 tons permits lifting heavy loads with clearance as low as 2½ in. *In charge—W. B. Dyke.*

• **BOWDIL CO.**

Will demonstrate a new versatile, telescoping, sturdily-built, light weight transmit support. Basically a telescoping aluminum post, the surveyor simply sets the base on the mine floor and jabs top column into the roof, then locks in position. An arm on the main column contains a bubble rod level and accommodates the transit on a table that fits standard transits and is adaptable for varying bases.

Also featured will be running models of the latest Bowdil cutter bar, chain and bits in operation. *In charge—F. T. Bowman and H. M. Morrow.*

• **BRODERICK & BASCOM ROPE CO.**

Will feature two scale-model wire-rope machines actually making small diameter strand and rope. Accurate miniatures of typical wire rope machinery, these models should be of interest to all users of wire rope.

There will also be samples of various constructions of wire rope and braided safety slings with descriptive literature on each. *In charge—"Dick" Deutman.*

• **BROWN-FAYRO CO.**

Will include several important features in their exhibit. A man-trip car, 35-man capacity, is equipped with eight wheel, double trucks, and rubber cushioned axle mountings and spring bolsters. Hydraulic brakes on one of the trucks, and space for electric lamp batteries and dinner buckets are features designed for safety and convenience. Special provision has been made for handling a stretcher through doors in the front end of the car.

A new high-pressure "cold oil" spray outfit designed for dust-proofing and freeze-proofing coal and the newest "Brownie" model HGD rigging hoist to drag conveyors and other heavy machinery from place to place, will also be shown.

Latest model of the old reliable Austin-Brownie mine gathering pump with a V-belt drive, enclosed flood-oiled power frame, and anti-friction bearings rounds out the exhibit. *In charge—Fred M. Davis.*

• **BUCYRUS-ERIE CO.**

Plans an exhibit to call attention to its power shovels and draglines from ⅜ to 36 cu yd, including stripping shovels; tractor equipment; blast hole drills; and hydrocranes. *In charge—E. M. Heuston.*

• **BUDA CO.**

Is exhibiting three new DA Dyna-Swirl Diesel haulage equipment engines. Also on display will be new models of the 6-DAS-844 supercharged, six cylinder, 280 hp Diesel engine and a model 8-DAS-1125 supercharged, eight cylinder, 350 hp Diesel engine. A model 6-DA-844, six cylinder, 215 hp Diesel engine exploded to reveal the inside working parts on the new DA Dyna-Swirl combustion system will also be on display. All three of the engines on exhibition are completely new and modern for powering all types of strip mines and haulage trucks. *In charge—H. H. Cohenour.*

• **CALCIUM CHLORIDE ASSN.**

Will feature methods for using calcium chloride to freezeproof coal and for laying dust on shuttle-car runways. A large size slide projector with black and white and color slides will be the means of conveying this information and also to show how calcium chloride may be used in other ways around mining operations. Among these other uses are: dustlaying, fire protection, ice control, and base and surface stabilization of strip mine haulage roads. *In charge—George H. Kimber.*

• **CARBOLOY CO., INC.**

In charge—W. S. Baker.

• **CARDOX CORP.**

Cardox (carbon dioxide) and Airdox (compressed air) the nonexplosive mining methods for dislodging coal at the face will be featured. Two new Cardox coal drills for underground and surface continuous auger-mining will also be on exhibit. The augers are from 20-40 in. in diameter and the underground drill features permissible electrical equipment. Also included in the exhibit will be a vertical drill for strip mining as well as the complete line of Cardox drilling equipment including augers, molefoot and tungsten carbide tipped cutter heads, bits, thread bars and boxings for both underground and surface drilling.

• **CARLON PRODUCTS CORP.**

Will display the various grades of Carlon plastic pipe now in nation-wide distribution. The exhibit space will be dominated by a large display featuring Carlon "E" flexible pipe and Carlon plastic pipe fittings. The display will illustrate a miniature scene of a coal mine shaft to highlight uses for this material. Actual samples will be available so visitors can see for themselves the physical characteristics which fit Carlon for use under the most severe acid conditions found at mines.

A rigid material in sizes for casing boreholes will be introduced. *In charge—C. R. Stowe.*

• **CATERPILLAR TRACTOR CO.**

On display for both miners and other exhibitors will be a most complete array of "Caterpillar" machinery. The following units will be shown: A D7 Diesel tractor equipped with Traxcavator, a D9 Diesel tractor equipped with 8U bulldozer and Hyster D8L towing winch, a D7N towing winch, a No. 12 Diesel motor grader, a DW20 tractor with Athey PD20Q side dump wagon, a DW21 tractor and scraper, a D397 industrial engine, a D337 Diesel engine, and a D397 Diesel cutaway engine. A staff of representatives will be present to provide information to all visiting the exhibit. *In charge—H. H. Howard.*

• **CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.**

Manufacturers of continuous centrifugals plan to have an "E" model machine as the main feature of the display. *In charge—P. W. Bigley.*

• **CHEATHAM ELECTRIC SWITCHING DEVICE CO.**

Will display a full size electric track switch and derail equipment designed for high speed main line haulage. Other features of the exhibit will be trolley contactors that can be installed on trolley wire suspended below one M.C.M. feeder, and switch position indicators which permit a quick change of lens color and location. Manually operated momentary contact switches, control panels, circuit controllers and other equipment complimenting electric track switches and derails operated from high speed rolling equipment or ground stations will be shown. *In charge—Everett C. Brown and Arthur Gilbert.*

• **CHICAGO PNEUMATIC TOOL CO.**

A tire mounted Tramdrill and the new mobile roof bolting unit will be the central feature of the exhibit. The Tramdrill is electrically driven and actuated. Standard drill arms permit 120° of lateral movement within 4 in. of the roof or bottom and 4½-in. slot holes can be drilled 8½ ft per minute at any angle within these limits.

To aid in roof bolting the new mobile roof-bolting unit is an electrically-driven combination unit for drilling bolt holes and running nuts. One motor drives both auger and nut runner; built-in slip clutches protect the feed motor from stalling and adjust nut running torque. Drilling time for a series of 1⅝ in. diam holes 46-in. deep, bolt installation and nut running has averaged less than five minutes per bolt.

Also shown will be the regular line of hand held and post mounted coal drills, portable electric saws, and demolition tools. Air operated roof bolting stopers and impact wrenches will complete the display. *In charge—L. J. Walker.*

• **CINCINNATI MINE MACHINERY CO.**

Promise a novel display combining units of the "Cincinnati" cutterchain line, as well as cutterbits, cutterbars and sprockets, with blowups of action pictures indicating the use of some of these products in service. *In charge—John R. Cartlidge.*

• **CITIES SERVICE OIL CO.**

Will feature lubricants for industrial purposes, and specialty products including rust preventives and remover, solvents and core oils. A feature of the display will be the exclusive Power Prover which measures unburned fuel in the exhaust gases of gasoline engines; the Industrial Heat Prover which measures combustion efficiency on any type of furnace, using any form of fuel. This exhibit is a joint presentation of the Cities Service marketing companies including: Cities Service Oil Co., New York and Chicago; Arkansas Fuel Oil Co., Shreveport, La.; Cities Service Oil Co., Ltd., Toronto, Canada. *In charge—L. H. White.*

• **CLARKSON MFG. CO.**

The Clarkson 28FA "Redbird" loader together with the Clarkson famous uni-flight conveyor chains and double-swing double doors for shuttle cars will be on display. Mounted on dual tires and with the differential eliminated the loader gives unheard of traction on the wheels.

Uni-flights and conveyor chains on exhibition will illustrate the heavy duty connecting pins and solid flight attachments characteristic of this machinery. Fully mounted and illustrated will be the Clarkson double-swing double door equipment for shuttle cars. *In charge—Clyde E. Clarkson.*

• **CLEVELAND WORM & GEAR CO.**

Will display a Cleveland Worm & Gear speed reduction unit in operation. A Cleveland Worm & Gear set will be mounted and running separately. These drives are the

types used very extensively in the coal industry on conveyors, shuttle cars, loaders and other moving equipment. *In charge—G. T. Collatz.*

• **COAL AGE**

Will have a display depicting the publication's service to readers; copies and information on affiliated publications, mining catalogs, coal mine directory and Keystone Coal Buyers' Directory. *In charge—R. W. Davis.*

• **COAL MINE EQUIPMENT SALES CO.**

Will show a miniature rebuilt locomotive (built by the men in the company's shop) showing how a locomotive that has been used for many years can be rebuilt into one with all new modern equipment. A feature of the exhibit will be the hundreds of circulars showing various items of equipment available in the company warehouse in Terre Haute as well as many items scattered in practically every mining district in the United States.

Souvenirs will be given to all the ladies and gentlemen who visit the company's booth. *In charge—Frank J. Wolfe.*

• **COFFING HOIST CO.**

Will exhibit two feature attractions—the new hoist binder and a new coil chain, safety pull, ratchet-lever hoist. The new coil chain ratchet-lever will be a ¾ and 1½ ton capacity model. It is the only coil chain ratchet-lever hoist using the ratchet and pawl principal for lifting, lowering and holding the load. In addition the Coffing Hoist Co.'s complete line of portable hoisting equipment will be on display including the safety pull ratchet-lever hoists, Quik-lift electric hoist, spur gear hoists, safety load binders, Mighty Midget pullers and Hoist-alls. *In charge—Mike Crowder.*

• **COLORADO FUEL & IRON CORP.**
Wickwire Spencer Steel Division

Main feature of this display will be wire rope. There will be 26 standard wire rope samples attached to a display board as the nucleus of the exhibit. There will also be numerous individual pieces of wire rope for closer inspection. The secondary feature of the exhibit is the Wissco metal processing belts, Wissco super-tempered precision screens and Wissco perforated metals. Samples of these items will also be attached to a display board and there will be loose samples of screens for the visitors' close inspection. *In charge—George Jennings.*

• **COMBUSTION ENGINEERING-SUPERHEATER, INC.**
Flash Dryer Division

A plastic working model of the C-E Raymond flash drying system for fine coal will be the feature of this exhibit. The model will show the flow of coal through the dryer in a very effective manner. *In charge—C. W. Gordon.*

• **COMPLETE-READING ELECTRIC CO., INC.**

No description available.

• **CONNELLSVILLE MFG. & MINE SUPPLY CO.**

The company's equipment used in handling coal from mine car to railroad car, such as rotary mine car dumpers, sheave wheels, skips, cages, hoists, haulage and related equipment will feature the company's exhibit. Literature will be provided. *In charge—E. F. Charlton.*

• **CRICHTON CO.**
Equipment Division

Will exhibit the Crichton drill which is a strictly mechanical, light weight, ultra-speed machine which is said to combine speed, safety and economy. It operates from a power take-off easily adapted to most mining machines. It can be used to drill holes in the roof as well as blast holes in the face. It has a multi-disc safety clutch which prevents its twisting out of operator's hands if hard partings are encountered. Its flexible shaft includes a safety device to stop the drill if more than 10 hp is consumed. *In charge—A. B. Crichton, Jr.*

• **CUMMINS ENGINE CO., INC.**

Will display three activated cutaway Cummins Diesels. The three exhibit engines of the lightweight, highspeed, high horsepower Cummins line are the 150 hp model JS-600; the 300 hp model NHRS-600 and the 550 hp model NVHS-1200. These cutaway versions have been sectionalized to show the internal structure and the operation of the following units: the Cummins fuel system, including the new DD "double disc" type fuel pump; cylinders and liners; valves; pistons; supercharger and supercharger drive; gear train; water pump; oil cooler; lubricating oil pump; oil pan; crankshaft; camshaft and the four-cycle principle of operation. In addition the Cummins booth will show a number of enlargements of mining application photographs to show Cummins Diesels at work in the nation's coal fields. Plans also call for the exhibition of a Cummins parts display. *In charge—Howard P. Sharp.*

• **D-A LUBRICANT CO., INC.**

Will display each of the heavy duty oils and lubricants manufactured and distributed by the company. There will also be shown the actual lubrication of a cutaway heavy duty gear box. Visitors are invited to rest while discussing lubrication problems at this "Hospitality Booth." *In charge—Robert J. Binford, Jr.*

• **DART TRUCK CO.**

No description available.

• **DAVIS CO., NELSON L.**

Made up in three sections, the main or center display will feature a schematic panel showing the operation of a two-stage processor heavy-media coal cleaning plant. Designed to permit full control of the ash content of the cleaned product and at the same time prevent loss of combustible material in the rejects, this unit will permit recovery of float coal at levels down to 1.35 Sp.G. and a sink reject at levels up to 2.00 Sp.G. together wtih isolation of the intermediate product. On one side of the two-stage processor will be the standardized packaged coal cleaning plant in capacities of 50 to 325 tph. On the other side will be a series of photographic blowups and illuminated transparencies illustrating the packaged coal cleaning plants and custom built coal washeries. *In charge— N. J. Ali.*

• **DEISTER CONCENTRATOR CO., THE**

Will exhibit a SuperDuty diagonal-deck coal washing table. The unit on display will be built to scale one-fourth the size and capacity of the standard commercial unit. It will operate at reduced speed for demonstration purposes. Also featured in the exhibit will be a model 108 Concenco revolving feed distributor, a full size commercial unit for handling equalized distribution to a battery of coal washing tables. *In charge—Don A. Weber.*

• **DEISTER MACHINE CO.**

Will have in operation one of the latest types of Deister vibrating screens. A unit-type vibrating mechanism completely assembled to close tolerances and then mounted as a unit on the vibrating screen is a feature of the exhibit.

An illuminated cross-section of the vibrating mechanism will be on display so the operator can visualize how few parts are subjected to wear over a long period of time. Also to be exhibited are installation photographs of Deister Plat-O coal washing tables, with operating data. *In charge—I. F. Deister.*

• **DEMING CO.**

Will display a Deming Fig. 1896 "Oil-Rite" double acting mine pump with bronze water end and a Deming Fig. 3312 self-priming pump with bronze water end with two-inch suction. Also included in the exhibit will be a display showing how Deming nozzles can be used in spraying coal to allay dust. *In charge—Gordon Allen.*

• **DENVER EQUIPMENT CO.**

Will show the practicability of flotation for the recovery of coal fines. Actual flotation of minus 10 mesh anthracite coal will be demonstrated by means of a small pilot plant using a two-cell, Denver super-agitator and Denver vertical sand pump. Samples will be shown of typical results of coal recovery through the use of flotation. *In charge—William F. Haddon.*

• **DETROIT DIESEL ENGINE DIVISION, GENERAL MOTORS CORP.**

Will exhibit a Series 71 three-cylinder fan to flywheel model with a basic engine rating of 100 bhp at 2000 rpm; a Series 71 six-cylinder fan to flywheel model equipped with GM torque converter with basic engine rating of 200 bhp and a six-cylinder 6-110 model in the 200-275 hp class. Motor-driven cutaway models of the 6-110 model and the GM torque converter will be included in the display. *In charge—E. F. Bentley.*

• **DIFFERENTIAL STEEL CAR CO.**

In charge—R. D. Flowers.

• **DINGS MAGNETIC SEPARATOR CO.**

Will feature the Crockett magnetic separator widely used in the Heavy-Media process for efficient recovery and cleaning of the magnetite medium. The medium recoveries obtained in commercial plants by the Crockett separator will be highlighted and the operating features of the machine will be emphasized. Also on display will be the new Deep Burden Rectangular Suspended Magnet capable of removing tramp iron from a conveyor belt when suspended 24 in. above it. The regular line of electro and permanent magnetic pulleys used for tramp iron protection in coal preparation plants will also be displayed. *In charge—R. J. Haskin.*

• **DODGE MFG. CORP.**

"See for yourself how it works . . ." is the thought behind the action displays in the exhibit of Dodge power transmission machinery for the coal industry. This applies particularly to the new torque-arm speed reducers, TAPER-LOCK solid steel conveyor pulleys and Dodge-Timken bearings which will be seen in action. Dodge couplings and take-ups will also be displayed.

The new Dodge slide-set vise that saves time, money and operator fatigue will be demonstrated. The visitor not only can work this ingenious machinist's vise himself, but can also watch the internal mechanism operate as he does so. *In charge—Carl Beebe.*

• **DOOLEY BROS.**

Will feature a new contactor which promises to be of great interest to all operators and manufacturers who use or build electrical equipment. Also to be shown for the first time is the new Superior hydraulic drill which is proving its worth in tests now being conducted. Various assemblies of post mounted drills and a full line of augers and cutter heads will also be on display.

One end of the booth will be a large rest area with comfortable upholstered seats and a water cooler. Valuable gifts will be given to those visiting the Dooley display. *In charge—R. A. Dooley.*

• **DUFF-NORTON MFG. CO.**

Will display a complete line of jacks that meet every modern mining need. Featured in the display will be mine-timbering and roof-support jacks, pin-timbering and angle jacks, and 5-20 ton ratchet jacks for rerailing mine locomotives and cars, bracing loading and cutting machines. Other jacks displayed will be screw, ratchet and hydraulic jacks in 5-50 ton capacities for general mine service. *In charge—E. H. Hodgson.*

• **DU PONT DE NEMOURS & CO., INC., E. I.**

Plan to feature Du Pont products for both underground and strip coal mining. In the former classification will be shown permissible explosives, iron wire electric blasting caps, permissible blasting machine and the Du Pont "Detect-a-Meter." For strip mining will be featured Nitramon, Du Pont Red Cross Extra and the Du Pont Primacord Delay Connector. These devices are used to provide intervals between holes and between rows in a wide variety of hook-ups. *In charge—J. D. Lawrence.*

• **ELECTRIC CONTROLLER & MFG. CO.**

A new automatic reclosing sectionalizer with pulsating low-ampere load-metering principle will be the feature part of this exhibit. Other items will be "Tab-Weld resistors" for motor controllers, a new under voltage protection circuit for ac motor starters and a "Valimitor starter for 2300-4600 v. motors." *In charge—R. M. Phillips.*

• **ELECTRIC STEEL FOUNDRY CO.**

Builders of the ESCO line of dragline buckets and dippers for stripping and loading will feature ESCO box-type points and adapters, ESCO manganese steel dragline bucket fittings, manganese steel, dozer blades and alloy steel blade and bits. *In charge—John Oliver, Thomas P. Kirby, Earl Berger and Joseph E. McQuaid.*

• **ELECTRIC STORAGE BATTERY CO.**

Will display Exide storage batteries for every type of coal mining application.

Another attraction will be the Exide Dynamobile, a scale model convertible powered by an Exide Hycap automotive battery. A defense bond will be awarded the visitor who comes nearest to guessing the number of times this miniature car laps the track before the battery is discharged.

An impact test demonstration will show the unique qualities of Exide's new corrosion-proof abrasion-proof coating for steel battery trays. Additional displays will include a giant Exide Ironclad positive plate, a jumbo model of one of the slotted rubber tubes used in this plate, cutaway cells and motive power batteries. *In charge—George F. Krauss.*

• **ELLIOTT SERVICE CO.**

Will feature the Elliott Coal Mine Bulletin Display Service, which provides daily changes of news pictorials, weekly changes of coal mine displays, in color, covering such operating problems as safety, waste and cost reduction, work improvement, production, and economics.

Management Information is a weekly bulletin for mine foremen. It covers the fundamentals of good supervision. Also on display will be training outlines, booklets, and other items of interest to coal operators. *In charge—J. R. Lancaster.*

• **ELRECO CORP.**

Will exhibit the new Elreco Inverted Trolley system, which is being displayed for the first time. This system will increase mine haulage safety and reduce maintenance costs by eliminating such dangerous operations as nipping, back poling, and "dogging the pole."

Five of Elreco's newest products for the mining industry which will also be featured are: the Elreco roof-bolting method; new and improved Elreco fused trolley-tap for mining machines and locomotives; the new Elreco "J" hook, for temporary or semi-permanent hanging of feeder wire and pipe; the new 1,500,000 CM combination feeder cable and trolley wire clamp; and the all new Elreco Slider type trolley shoe and harp, which offers new features in current-collector shoes. The standard line of popular Elreco section insulators, quick-break mine switches, expansion bolts, hangers, clamps and fittings will round out the display. *In charge—Douglas H. Parker.*

• **ENSIGN ELECTRIC & MFG. CO.**

Will exhibit Ensign-Clark magnetic mine starters in open and explosion tested enclosures for ac and dc. Also Ensign mine power distribution boxes in dustite and permissible enclosures; Ensign centrifugal switches for underground belt conveyors, providing belt protection and sequence operation. Other items that will be on display are the Ensign drill boxes, complete with contactor, and Ensign rail bonds, trolley guard supports and cable splicers. *In charge—W. P. Dickson.*

• **ENTERPRISE WHEEL & CAR CORP.**

Exhibit will be centered around a mine car in which will be included the latest improvements in design. *In charge—Robert W. Lahr.*

• **ERICO PRODUCTS, INC.**

Will demonstrate a new development for splicing mine machine cable. Welding of No. 8 through 4/0, type W mine cable and twin type G mine cable is a new revolutionary application for the Cadwell process. A new type M welder with bench fixture is now in use. This fast Cadweld operation requires no skill—the only preparation necessary is stripping the insulation. The time required for a splice is less than ten minutes. *In charge—Noble Carlson, Syd Gane and Harold Page.*

• **EUCLID ROAD MACHINERY CO.**

Plans to display three types of haulage units. One of the features will be a twin engine scraper with 190 hp engines mounted front and rear. Self-loading, it is ideal for stripping and for coal stock piling and reclamation. The 25-ton bottom-dump coal hauler for use in the bituminous field and a spring-mounted 22-ton model TD rear-dump will also be on display. *In charge—V. L. Snow.*

• **FAIRMONT MACHINERY CO.**

Exhibit will be arranged with colored photographs of actual cleaning plant installations. The feature of the exhibit will be a "scene-in-action" display of the Chance Sand Flotation process.

The booth will be fitted with comfortable furniture to permit anyone to rest and to discuss specific problems with Fairmont personnel. *In charge—R. W. Decker.*

• **FARMERS ENGINEERING & MFG. CO.**

Announce a new type plug-in Trolleyphone, embodying new and unique developments to improve performance considerably and reduce service problems. Among the several unique displays to support this announcement will be one of a coal mine in miniature to illustrate the uses of Trolleyphone communication equipment. The underlying theme of the exhibit will cover the use of Trolleyphones in the coal industry. *In charge—John Trbovich.*

• **FARVAL CORP.**

Exhibit will be built around Farval centralized systems of lubrication which will be on display and in operation. Prominent among these will be a large animated model of the famous Farval dualine measuring valve for lubricating bearings; the recently developed Farval spray valve specifically designed to lubricate open gearing and slide surfaces. *In charge—G. T. Collatz.*

• **FIRTH STERLING STEEL & CARBIDE CORP.**

Will feature Firthite mining tools with particular emphasis on "pin up roofing" and the resultant savings in materials and cost to the operator in regions where such methods can be employed. On display will be pictures of Firthite mining tools in actual use. In a showcase will be shown all of the company's line better known in the field as Blue Bits. Literature will be available and a special card listing all standard tools showing dimensions and other pertinent details will be on display. *In charge—E. G. Moffat.*

• **FLEXIBLE STEEL LACING CO.**

Plan an exhibit built around a 19-ft inclined belt conveyor. This 24-in. wide troughing conveyor belt will demonstrate the application and use of the various types of belt fasteners manufactured by the company. *In charge—Warren B. Paulson.*

• **FLOCKER & CO., JOHN**

Dry treated flame- and mildew-resistant jute brattice cloth, in addition to the new plastic brattice sheeting which the company distributes for the Firestone Plastics Divisoin, will make up the display. Featured will be an underground scene in a coal mine designed so that visitors may have an opportunity to blow torch test the brattice cloth for flame resistance. *In charge—Ralph H. Irwin.*

• **FLOOD CITY BRASS & ELECTRIC CO.**

Display will be concentrated on the mine pump line, especially a 2½ by 3-in. plunger pump developed during the last year. Also on display will be repair parts for mining machines and locomotives, trolley line material, fused switches, sealed beam headlights and room and car spotting hoists. *In charge—Walter Jacobs.*

• **FULTON BAG & COTTON MILLS**

Blaze Braker and F.F.F.F. Brattice Cloth and Tamping Bags produced for coal mines will feature this display. *In charge—E. M. Hornsby and C. W. Webb.*

• **FYR-FYTER CO.**

A full line of portable fire extinguishers and supplies, featuring special equipment designed for mine use, will make up the exhibit. Instant model equipment, using Karbaloy, for mounting on mine fire cars will be shown. Also on display will be a new line of dry chemical ex-

tinguishers built of stainless steel and featuring a new design. *In charge—George J. Lutz.*

• GENERAL ELECTRIC CO.

No description available.

• GOODMAN MFG. CO.

Two new type tractor tread loaders, the 860 low type and 665 standard height, both featuring swing loading head, swing discharge end and new safety innovations will be exhibited. Also a new type 580 elevating discharge shuttle car, a new type RHT.2 tractor-tread truck with cable reel and power take-off, a type 512EJH shortwall with hydraulic control and a bugduster will be shown using the tractor tread truck. An L-20 underneath drive for shaking conveyors which results in extremely low height and small over-all dimensions will be displayed with a new swing motion device on K type duckbill. The E-11 drive on a size 0 pan line for the new lightweight Duckling designed for ready portability and loading in narrow gangways will also be displayed. A tail-end section of a heavy duty belt conveyor, type 99, will show the design of this line. A sizable display of Goodman supply parts will show the new type 69 chains, a Camtactor Controller, a belt conveyor roller switch and also a type 121 bugduster as furnished for type 12 shortwalls now in service in the field. In all probability, the exhibit will include a new type of mining and loading machine. *In charge—J. D. James.*

• GORMAN-RUPP CO.

Will present a new improved line of self-priming centrifugal mine pumps. This will be the first public presentation of newly designed two-inch and three-inch models, which incorporate many new features including outstanding performancing with lower horsepower requirements. Exploded models will be on display to permit thorough examination by visitors. One of the pumps will also be shown in operation in a demonstration illustrating the advantages of the self-priming design. The line of centrifugal pumps and self-priming contractors' pumps for strip mine operations will also be exhibited. *In charge—Gilmore Hiett.*

• GOULD-NATIONAL BATTERIES, INC.

Will feature a "plus-performance plan" to conserve and extend essential battery power. The plan, geared to the present emergency conditions, is aimed to help industry get more from its batteries—to choose, use, handle and maintain them without waste. *In charge—Leslie Broomfield.*

• GULF OIL CORP.

Will feature quality petroleum products for "at the face" lubrication of coal mining equipment as well as outside tipple equipment. The exhibit will dramatize the use of Gulf mining machine lubricant B and Gulf mine car grease by means of action displays. Special emphasis will be given to a new product called Gulf cam grease and its specialized application to mining machinery. *In charge—Homer Goddard.*

• HAMILTON RUBBER MFG. CORP.

Hamilton's King Koal conveyor belt will be the central feature of this exhibit. Practical engineering and laboratory work were combined to produce this belt to excel in service. *In charge—Hobie Todd.*

• HARNISCHFEGER CORP.

Description not available.

• HENDRICK MFG. CO.

In addition to a special exhibit showing samples and photographs of various installations in the field, one of the testing screens used for laboratory testing in the sizing of bituminous coal will be set up and in operation. *In charge—T. A. Warner.*

• HENDRIX MFG. CO., INC.

Plan to exhibit their latest model Hendrix dragline buckets in popular coal stripping size. *In charge—W. G. Hendrix and G. E. Trippe.*

• HERCULES MOTORS CORP.

Three working cutaways will visibly explain the advantages of the four-cycle, high-speed, light weight Hercules Diesel engine. The cutaway engines show the operation of the patented Hercules combustion chamber and also the precision and engineering skill incorporated in all Hercules Diesel engines.

A number of gasoline and Diesel power units will also be displayed. These are of particular interest to mine operators because of their flexible application to many types of installations.

Also on display will be several Diesel replacement engines for light trucks. Hercules furnishes a complete Diesel replacement package including all parts and equipment necessary to make the change over from gasoline to Diesel operation in popular light trucks. *In charge—T. S. Klinedinst.*

• HERCULES POWDER CO.

Exhibit will consist of five panels describing the use of Hercules explosives for coal mining. Among those displayed will be permissible types for mining coarse and fine coal, explosives for bank preparation in stripping operations, and short period delay electric detonators. The new ten-cap permissible blasting machine will be featured and occupy a prominent place in the display. *In charge—Theodore Marvin.*

• HEWITT-ROBINS INCORPORATED

A transparent cover over the drive mechanism of the latest style Eliptex dewaterizer will allow visitors to examine the new drive in all its details. This new drive represents a change over from chain to gears and is an innovation that has proved effective in the installations now operating. A new spring-mounting for the Vibrex screen also will be exhibited here for the first time. *In charge—R. U. Jackson.*

• HEYL & PATTERSON, INC.

Plan to show a full size "Drying Dutchman," the Reineveld centrifugal coal dryer, operating at a speed of approximately 50 rpm. A section of the bonnet will be cut away to show the basket and scraper assembly. The gear box will be provided with a plastic cover showing the operation of driving gears. This machine, recently introduced into the United States, has proved so satisfactory that a number of new units have been ordered. Also on exhibit will be the standard Cyclone thickener, used extensively for clarification of circulating water circuits in coal preparation plants. The Cyclone thickener permits closed circuit operation and eliminates stream pollution. Its inherent classification characteristic makes it applicable for desliming not only in coal but also in the metal mining field. *In charge—A. G. Gilbert.*

• **HOLLINGSHEAD CORP., R. M.**
Cocoon Engineering Division

Will provide a mock-up depicting a coal mine. Within the display a procedure for a sprayable, plastic, sealed dry-block stopping will be portrayed. The product used in this demonstration is G. E. Cocoon, a newly developed sprayable plastic film which permits salvage of the material used for the stopping. The advantages of this plastic film will be graphically shown as compared to present methods. *In charge—F. H. Lee, Jr. and W. L. Carolla.*

• **HOLMES & BROS., INC., ROBERT**

Present a three-fold display. The Baughman "Verti-Vane" Thermal coal dryer's operation and construction will be displayed in a half-size colored sectional view. The new Holmes "Verti-Vibe" screen which will be on display features vertical screen action giving higher efficiency and greater capacity. The latest model Holmes coal laboratory Crushers and pulverizers also on display feature higher efficiency, greater capacity, dustless operation, ease in cleaning and servicing. *In charge—James G. Walter.*

• **HOUGH CO., FRANK G.**

Will feature a display backdrop with appropriate photos—showing "Payloaders" in underground mining and strip mine operations in the mining of coal, lead, zinc and other materials. In addition to the backdrop will be featured the 1½ cu yd HM Payloader; the 1¼ cu yd HY Payloader and the HFH Payloader featuring the high lift. *In charge—Raymond P. Wiggers.*

• **HUBBARD & COMPANY**

Plan an exhibit devoted to bolting as a means of roof support. How roof bolts work and how they are installed will be graphically demonstrated. Feature of the exhibit will be a life-size mine entry in which visitors can see roof-bolts in place. *In charge—J. Howard Worley.*

• **HUNSLET ENGINE CO., LTD., THE**

Sends a Hunslet Diesel locomotive from England as the feature of the display. This line of Diesel locomotives has been certified for use underground in the coal mines of Great Britain since 1939.

• **INTERNATIONAL HARVESTER CO.**

This exhibit will be a joint display by both the Motor Truck and Industrial Power Divisions.

The Motor Truck division will display an International model LF-212, 161-in. wheelbase, six-wheel chassis and cab, and a model LFD-305 Diesel powered, 145-in. wheelbase, chassis and cab.

The Industrial Power division will exhibit TD-24 crawler and blade, TD-9 crawler with overhead loader, and a plastic miniature TD-24 electrically powered crawler. *In charge—Truck Division, J. W. Young;; Industrial Power Division, E. L. Boughton.*

• **INTERSTATE EQUIPMENT DIVISION, YARA ENGR. CORP.**

Will feature a number of large scale photographs illustrating several different types of aerial tramways, particularly their heavy duty type tramways for mine refuse disposal. These photos will depict portions of actual installations of tramways with capacities up to 400 tph, and self-dumping jib-back type tramways with 10-ton carriers operating at speeds of 1200 fpm. *In charge—Leo J. Vogel.*

• **IRWIN FOUNDRY & MINE CAR CO.**

Will show a G-40 reversible belt conveyor. Of unit construction for easy dismantling and quick transportation underground this conveyor illustrates the use of oil-filled roller and oil-filled pulley. This construction utilizes the oil as a lubricant and allows every roller and pulley on the conveyor, except the tandem driving pulleys, to be self-lubricating.

Drive head dismantles into five units. Intermediate sections dismantle into six component units. Sections are 8 ft long with top idler sets at 4-ft centers. All sections fit together without the use of nuts or bolts. *In charge—G. F. Sensenich.*

• **I-T-E CIRCUIT BREAKER CO.**

Will display against a background of jumbostats depicting other company products associated with mining applications, a KSC automatic reclosing circuit breaker as the featured attraction. Also will be shown a BT-4 industrial thermostat relay, and a type KB steel-enclosed circuit breaker. *In charge—M. W. Pennybacker.*

• **JEFFREY MFG. CO.**

Will have an exhibit which includes two Colmol continuous mining machines model "A" with heights from 33 in. to 53 in. and model "B" with heights from 45½-72 in. and up; another feature of this exhibit will be a new 25-ton eight wheel main line haulage locomotive. Another new item in the Jeffrey line is the Molveyor. They will exhibit a train of three units which consist of rubber tired sectional belt conveyors coupled together and to the Colmol for carrying coal to an entry belt conveyor. A shuttle car introducing new features in design and construction is another feature of the Jeffrey exhibit. Also exhibited will be a 70-URB rubber tired Universal coal cutter; a 74-BR all hydraulic operated drilling machine mounted on rubber tires; a heavy duty double roll crusher capable of crushing anything that comes from the mine face; a type 12-A six-foot diam Aerodyne mine fan; an Aerodyne midget blower; and a run-around display of mechanical vibrating conveyors and an electric vibrating feeder. In addition there will be many accessories and replacement parts. *In charge—J. H. Fulford.*

• **JOHNSON PLASTIC CORP.**

A 250-ft coil of Johnsonite flexible plastic pipe will be featured in this display demonstrating the uses of the product in the coal mining industry. *In charge—W. F. Miller, Jr.*

• **JONES & LAUGHLIN STEEL CORP.**

Description not available.

• **JOY MFG. CO.**

Will feature a large collection of equipment for the bituminous and anthracite coal mining industries. Of special interest to thin seam operators will be the new 12-RB mobil cutter, 8-SC shuttle car, and 20-BU-1 loader for high capacity production in very low coal.

To those with difficult face preparation problems the new Joy combination drilling and timbering machine will be of importance.

Two new methods of haulage for use behind Continuous Miners will be on display. An outdoor display will feature the first public demonstration of the Joy Champion continuous blast-hole drill for overburden shot-holes and a new Diesel-driven auger drill for highway recovery.

Another section of the exhibit will be devoted to a display of roof-bolting drills and compressors. New items in this section will include two self-propelled roof-bolting drills and three hydraulic impact wrenches.

Of special interest to electrical engineers will be a new magnetic-lock type connector for mine cable, a new safety ground-protective device, and a new safety ground trip for dc applications. A new push-pull type connector is equipped with a shroud, covering the male contacts. Continuous miners, shortwalls, mine fans, portable blowers, chain and shaker conveyors, cable connections, vulcanizers, power distribution systems, carpullers, and tungsten-carbide bits will also be on display. *In charge—R. E. Campbell.*

• KANAWHA MFG. CO. & FUEL PROCESS CO.

This joint exhibit will feature the Belknap coal washer, a full size washer unit completely assembled. This latest design duplex model is suitable for handling a raw coal feed of 70 tons per hour with a size range of from 7⅝-in. coal. The washer will be fully equipped with conveyors, drives and all accessories assembled in place as installed in actual practice. A featured part of the exhibit will be a demonstration of automatic controls for maintaining a constant specific gravity and uniform solution level within the washer. *In charge—Orris L. Watson, Fuel Process Co.; and George H. Best, Kanawha Mfg. Co.*

• KENNAMETAL INC.

Will feature a new style HFD bit for rotary drilling roof-bolt holes. The bit will be rotated in a simulated mine roof of the kinds of material which the bit drills. The over-all theme is that Kennametal tungsten-carbide bits can serve any cutting or drilling need in the coal mine. Emphasis is also placed on a sound field representation by mining men, trained and experienced in ways to apply tungsten-carbide tools underground for best results. *In charge—Richard L. Farris.*

• KENSINGTON STEEL CO.

Plan to feature Kenkrome (alloy manganese steel) chains for preparation plants and renewable tooth sprockets for use with these chains. On display mounted in panels will be representative parts chromium plated. It is also planned to have a miniature conveyor utilizing renewable tooth sprockets and a popular type of preparation chain.

• KOPPERS CO., INC.

Will feature a mechanical book whose pages graphically illustrate a study by the Committee on Haulageroads, Coal Division, AMC. Figures from the study show that in one mile of main track, pressure-treated ties save $23,286 over untreated ties in a 20-year period.

Rounding out the display are a map showing strategic locations of Koppers treating plants and a turntable illustrating with samples and photographs the essential steps in pressure treatment of wood. *In charge—R. W. Watson.*

• LEE-NORSE CO.

Plans to exhibit the "Koal-Master." This is a rubber tire mounted cutting and loading machine of the continuous mining machine type. It weighs about 20 tons and is suitable for high coal seams. This machine produces intersecting diagonal cuts in the face of the coal thus the entire surface can be cut continuously and a high percentage of the coal will break off the face. Capacity is about two tons per minute. Also exhibited will be a model RJ4 "roof service jeep." This is a rubber tired vehicle equipped with hydraulic roof drill mounted on a boom. It also can be used for setting timbers and the machine is equipped with a timber saw.

A model TJ1 "mine jeep" will complete the exhibit. This is the standard Lee-Norse mine jeep that runs on track and serves as a special transportation unit for key personnel and mine officials. It can also be used for transporting men and for many other purposes. *In charge—Rolf F. Arentzen and L. Ted Hindman.*

• Le ROI CO.

Cleveland Rock Drill Division

Will offer for first public showing a new permissible electric motor driven, crawler type, stoper jumbo for roof bolting. This jumbo has three speeds forward with a reverse speed and side operator's seat for movement in either direction. Operating controls are all convenient for the operator. A feature of the jumbo is the incorporation of a dust control collector for each stoper. Each of these dust collectors has a filter area of 60 sq ft. The standard steel change is 12-in. thus providing a 16-in. feed. Feed legs can be provided for various coal heights. With the new jumbo roof holes can be located from the roof instead of from the floor. Ample capacity for a full day's supply for roof bolting can be carried on the jumbo. The exhibit will be rounded out by a complete line of other roof bolting stopers, and rock drills applicable for the coal mining industry.

• LESCHEN & SONS ROPE CO., A.

Will display an illuminated and revolving reel of Leschen's Hercules Red-Strand wire rope flanked on either side by photo murals of the rope in use.

Samples of the many types of wire rope used in the mining industry will be on display to demonstrate details of construction. There will also be samples of appropriate fittings and "Hercules" Red-Strand wire rope slings. *In charge—Walter C. Richards.*

• LeTOURNEAU, INC., R. G.

Will feature two materials-handling tools which have gained wide acceptance in the mining field. These are the model C Tournamatic Tournarocker with torque converter, a shovel-, clamshell- or dragline-loaded 18-ton capacity hauling unit which dumps its load by up-ending the body; and the super C Tournadozer with bulldozer blade, a high speed, rubber-tired wheel tractor, widely used in coal stripping operations, and as a pusher tractor or as a tool to pull or skid mining equipment. The Tournadozer makes job-to-job moves at 19 mph. *In charge—S. C. Czerwinski.*

• LINCOLN ENGINEERING CO.

In the exhibit presented by Lincoln Engineering visitors will have an opportunity to inspect working displays of the very latest in automatic, semi-automatic, and manually operated centralized lubrication systems for use on equipment such as tipples, shaker screens, loaders, conveyors, and other types of production and material handling machinery. A feature of the exhibit will be Lincoln's time-proven hydraulically operated hydra-luber pump, and the CentrOiler centralized system designed to replace oil cans. In addition heavy duty, power-operated drum pumps, bucket pumps, grease guns, fittings and accessories will round out the exhibit. *In charge—Alvin Woodland.*

• LINK-BELT CO.

Keyed to the important problem of heat drying of fines at coal preparation plants, Link-Belt Co. will exhibit the multi-Louvre dryer employed in the company's laboratories for the drying of quantity samples of coal shipped

in by customers. A motion picture, in color and with sound, will show the operation of the Link-Belt float-sink concentrator employed in the heavy-media process of cleaning coal. A CA double-deck vibrating screen and a 25-ft long oscillating conveyor will also be exhibited in operation. Another operating unit will be a hydraulically controlled P.I.V. variable speed drive. An award will go to the person guessing the number of revolutions of its output shaft. To round out the exhibit there will be a display of belt conveyor idlers and a photographic background of actual installations.

• LINK-BELT SPEEDER CORP.

No description available.

• LONG SUPER MINE CAR CO.

Will highlight the new piggyback continuous room transportation system for mechanical loaders and continuous miners—with scale models depicting its use under various underground situations. In addition will be shown the new model 400-R room chain conveyors designed specifically to work with the piggyback in mechanical mining. These new room conveyors feature greatest possible ease of set-ups and moves to keep pace with the more frequent moves necessary with higher production rates of this new mining method. The new 400-R features the strongest chain and flights ever used on this type conveyor. The full scale piggyback—as well as models—will be shown. *In charge—J. B. Long.*

• LUDLOW-SAYLOR WIRE CO.

Is exhibiting a wide variety of samples of woven wire screens and wire cloths, including special abrasion-resistant Super-Loy square-opening screens in a full range of opening widths, and corrosion-resisting wire cloths and screens of various metals and alloys. Of special interest are STA-SMOOTH even-surface screens, and STA-TRU, STA-CLEAR and REX-TANG long-opening screens. *In charge—Frank B. Ungar.*

• McLANAHAN & STONE CORP.

In charge—J. Craig McLanahan.

• McNALLY PITTSBURG MFG. CORP.

Plan a display featuring Translite pictures of the new McNally-Tromp dense media bath and sectional transparencies of the Pulso dryer, Mogulwasher and other preparation equipment. On hand will be consultants for those with questions on coal washing, dense media separation, centrifugal or heat drying and general preparation plants. Latest bulletins will be available for distribution. *In charge—C. W. Waterman, Jr.*

• MACK MANUFACTURING CORP.

Will feature a Mack Model LVT tractor teamed with a 50-cu yd center-dump Heil trailer. Equipped with the Mack planidrive rear axle and eight speed Duplex transmission, the LVT is powered by a Cummins NHRBS 300 hp Diesel engine.

Another feature of the display will be the six-wheeled Mack model LRSW chassis, equipped with the Mack balanced bogie, a Schneider torque converter and a four speed Mack transmission also powered with the Cummins Diesel engine.

Against the background of large photos showing various off-highway operations will be exhibited the Mack power divider, the Mack eight speed Duplex transmission and the Schneider torque converter.

• MACWHYTE CO.

Here on display for close inspection, study and discussion will probably be the largest assortment of wire rope and slings ever assembled at a Coal Show. Visitors will have an opportunity to see, handle, discuss and study all the sizes and types of wire rope and slings on display. All are invited to ask questions of the engineers in attendance. *In charge—Forest J. Nelson.*

• MANCO MFG. CO.

Will display their complete line of portable hydraulic Guillotine cutting and riveting tools. Of special interest to mine operators will be the portable hydraulic roof bolt cutter that will trim one-inch roof bolts in three seconds. This tool weighs only 32 lb. Another machine on display will be the portable hydraulic rivet squeezer for riveting liners on cutting bars. The exhibit will be rounded out by a portable wire rope and wire cutter which will cut 1¼-in. wire rope or 1-in. rod in three seconds. This tool is operated either by electric-hydraulic, air-hydraulic, or hand pump. *In charge—B. E. Jasper.*

• MANU-MINE RESEARCH AND DEVELOPMENT CO.

New products of research including a portable automatic car-stop for safe trip accumulation, quick car-change, and spotting; ventilation accessories for effective dust control in mining; a paste compound for air and water sealing of brattice walls, mine doors, and air-shafts; improved reflectorized tunnel paints, fire-retardent paints, and mine car preservatives; an improved coal crusher; and examples of soil-solidification practice for sealing wet or fluid mine conditions by chemical injection are all featured in this exhibit. *In charge—Richard Ziemer.*

• MARION POWER SHOVEL CO.

Marion's miniature model 7400 walking dragline will be put through its operating paces as the feature of this exhibit. The model, a working, built-to-scale replica of the full size Marion type 7400 walker, will feature the Marion exhibit at this year's Coal Show. The display will also include a varied selection of enlarged color photographs showing the line of coal stripping and loading machines in action. *In charge—Robert J. Lick.*

• MARTINDALE ELECTRIC CO.

Will exhibit a motor and generator repair and maintenance equipment line which includes mica undercutters and saws, commutator grinders, Commstones, armature repair tools, armature testing instruments. Also exhibited will be electrical testing instruments, including an ammeter, voltmeter, ohmmeter, voltage tester and circuit tester. Metal marking equipment including four electric etchers and one mechanical etcher and a line of four portable electric blowers; seven series of flexible shaft grinding machines for maintenance or production jobs; four styles of circular metal-cutting saws; over 200 styles of rotary burs and files for a wide variety of production and maintenance jobs. In the safety line will be exhibited Martindale protective dust masks. *In charge—Roy Blersch.*

• MECHANIZATION, INC.

Exhibit will consist of a back-drop with large blow-ups of publications and information concerning them. Copies of current issues will be available for distribution to all interested visitors. *In charge—Raymond Coombes.*

• MICHIGAN AND SOUTHERN EQUIPMENT CO.

Description not available.

• MINE SAFETY APPLIANCES CO.

Improved illumination in mines; dust collection on roof bolting jobs; cleaner and safer mining machinery; better respiratory protection for the miner and more efficient rock dust distribution throughout the mine will be featured in this exhibit. Of special interest will be the new M.S.A. bolt hole cleaner, M.S.A. all-electric steam cleaner, the Edison model R-4 electric cap lamp, M.S.A. self-rescuer, Bantam and FaceDuster models of rock dusting machines, M.S.A. Pneolator and a complete line of safety equipment for the coal miner and operator. *In charge—C. M. Donahue.*

• MINING CONGRESS JOURNAL

Monthly publication of the American Mining Congress invites the foot-weary visitor to "set and rest a while" and learn about services performed for the entire mining industry. Of special interest will be copies of the magazine on display and Coal Mine Modernization 1951, which carries all the papers presented at the Convention's technical sessions. *In charge—J. C. Fox.*

• MINING MACHINE PARTS, INC.

Plan to show a small portion of the many repair parts now used in the maintenance and repair of underground coal loading equipment. Among these will be included bronze helical gears used in the 14 BU loaders, mating pinions, the MMP improved square head rivet caterpillar chains, miscellaneous drive shafts, clutch discs, clutch hubs, but the feature item in the exhibit will be the new MMP "loadmaster" universal conveyor chain, incorporating the drop forged solid block link. *In charge—W. P. Bigler.*

• MOBILE DRILLING, INC.

Plan an exhibit featuring Mobile drills designed for the mining industry and a new principle in rotary drilling. The B-35 is mounted on and powered by a light, four-wheel drive vehicle. Drills vertical or horizontal holes with the same unit either wet or dry. It comes in hydraulic or hand feed with variable auger rpm and can be used for prospecting coal, clay, minerals, oil (seismograph), sand and gravel. Another feature of the exhibit is the midget P-40 which is powered by a three hp engine and handles like a lawn mower. This machine weighs less than 300 lb, has a fast hydraulic feed and drills 2½-in. holes.

• MOSEBACH ELECTRIC & SUPPLY CO.

Expect to display a complete line of equipment including a cable snubber, a brake adjuster, feeder switches, rail bonds and line material. *In charge—John C. Loy.*

• MURPHY DIESEL CO.

Will have a 30 by 8-ft exhibit with large colored photographs of Murphy Diesel engines and generator sets. The center section of the display will have a slide changer which will feature the various Murphy Diesel installations. The company will also have one radiator cooled, skid mounted 100 kw, dc coal mine, compounded generator-set on exhibit along with cutaway sections of the engines and a supply of descriptive literature. *In charge—Paul Schnetzky.*

• MYERS-WHALEY CO.

Will exhibit a Whaley automat loading machine in action and also photographs of the machine operating under various conditions. There will be descriptive literature and catalogs available. *In charge—F. O. Ewell and Charles C. Whaley.*

• NACHOD & U. S. SIGNAL CO.

Will display a new automatic signal, for the first time, with control relays and indicating lights assembled on a steel chassis which can be quickly disconnected by plug and jack and pulled out of the dust proof metal case for servicing. The directional trolley contactor is especially designed to fit between one MCM feeder and 6/0 trolley wire. Among other units on display will be a new portable and visible warning signal and standard block signals with trolley contactors for safeguarding and expediting movement of locomotives over main line tracks. *In charge—Everett C. Brown.*

• NATIONAL ELECTRIC COIL CO.

Will exhibit typical examples of their products and services. Materials in process will be a part of the display. Typical products and services include windings for motors and generators from one hp up to 50,000 hp or KVA, electrical insulating materials, and the repair of motors and generators in three service shops; or in the field when equipment is too large to be transported economically to a shop. *In charge—J. H. Chevalier.*

• NATIONAL MALLEABLE & STEEL CASTINGS CO.

Focal point of the exhibit will be the NC-1 truck for mine cars. This truck embodies the same features that are built into railroad trucks, the result of 20 years' research in this field. In addition to the NC-1 truck there will be on exhibit Willison automatic couplers, Sharon 10 couplers (¾ size type G, side operating), M-230 rubber-cushioned draft gear for cars operating through rotary dump, M-225 rubber-cushioned draft gear for locomotives and large capacity non-rotary dump cars, and swivel and link hitchings. *In charge—Herbert H. Smith.*

• NATIONAL MINE SERVICE CO.

Will have two exhibits at the show. In Lower Lakeside Hall will be shown for the first time a Diesel mine locomotive for underground haulage. This unit will be 10 tons single or 20 tons in tandem. The Diesel mine locomotive provides smooth, effortless, dependable haulage with a steady flow of power at the wheels, and no jerking or jarring of the trip. It has full air control in braking and sanding. Another feature of this exhibit is the Hayden system of conveyor belt fastening equipment. Actual demonstrations showing the squaring of the belt, splicing with the Hayden ground pointed hooks and mending of rips and tears with repair clamps will be made frequently.

In the Arcade the National Mine Service Co. will exhibit a Wheat "forty-niner" electric cap lamp with its battery jar of Butalite plastic, increased light output and focusing headpiece; the Koehler flame safety lamp of new design, reduced size and simplified construction; and an extensive line of Bemeco products including the "NMS-45 and NMS-68" controllers, cable reel, intermediate gear with ball bearing mounting, brush holders, swivel-type cable guides with sealed ball bearings, and many other products including "Locolite" sealed beam headlights and replacement parts for all types of mining equipment. *In charge—Gordon MacVean.*

• NOLAN CO.

Will exhibit the Nolan Porta-Feeder model NL5N, five hp dc unit together with a complete set of parts showing the simplicity of replacement and sturdiness of construction. Unit will be operated by push button and the feeding action and portability of the unit in a mine will be fully demonstrated. Photographs and literature will be available showing complete line of car control and dumping equipment. *In charge—G. W. Merritt.*

• NORTHWEST ENGINEERING CO.

Will show photographs of shovels and draglines in operation in the coal mining industry. *In charge—G. C. Williams.*

• OHIO BRASS CO.

New safety and control materials will feature this exhibit and will include the form-H and form-J taps, their six contacts, and their terminals for easy cable attachment. Other control equipment will include the type-LG, type-KG and type-M distribution boxes. Four motor starters—the type-AF, type-BF, type-BH and type-BFG (permissible)—complete the major portion of the safety and control display. A second area in the exhibit will be devoted to automatic mine car couplers. The form-8 and form-9 couplers will be shown. The form-9 is an air connecting coupler for use on mine cars equipped with air brakes. At several counters in the booth, coal men will be able to see other mining materials of interest, including rail bonds and locomotive current collectors. *In charge—J. H. Sanford.*

• OHIO CARBON CO.

Although a general line of carbon products applying to industry will be displayed, this exhibit will specialize in mining equipment—principally carbon and copper-graphite brushes for locomotives, drills, conveyors, loaders, reels and collectors, mining machines, shuttle cars, trucks, hoists, and other miscellaneous equipment. Among these brushes will be models for stationary equipment such as motor-generator sets, rotaries, slip-ring motors.

Literature pertaining to proper brush application will be available. *In charge—F. C. Aurand.*

• OKONITE CO., HAZARD INSULATED WIRE WORKS DIV.

Will display a complete line of electrical wires and cables for mining machines, underground power distribution and all other electrical installations in and about the mines. Special emphasis will be placed upon Hazacord flame—and weather-resisting flexible cords and handy cables for every type of portable equipment. *In charge—Thomas R. Weichel.*

• OLIVER IRON & STEEL CORP.

Will feature a display board showing various styles and types of industrial fasteners such as machine, carriage, lag and special bolts, nuts, rivets, track bolts, plow bolts, tie rods, cap screws, studs, U-bolts and eye-bolts. They will also have sample displays of Oliver mine roof support bolts. *In charge—E. L. Bartsch.*

• OSGOOD CO. and THE GENERAL EXCAVATOR CO.

By means of slides and printed matter the many varied uses of the materials handling machinery manufactured by this company will be illustrated. These include rubber tire mounted clamshells, machines weighing up to 40 tons and ⅜-2½ cu yd crawler mounted shovels. *In charge—James S. Fortiner and L. O. McLean.*

• OSMOSE WOOD PRESERVING CO. OF AMERICA, INC.

Will present photos, models, timber specimens and complete technical files on mine roof, wood preservation and the Osmose processes and preservatives. Descriptive literature and information on wooden mine roof plugs will be available. *In charge—Joseph M. Bray.*

• PAGE ENGINEERING CO.

To accentuate the theme of progress, in this exhibit there will be displayed a replica of one of the first dragline buckets made, in 1903, beside a modern all manganese steel bucket.

Pictures, the latest in Page dragline literature, dragline efficiency graphs and yardage records will be available for all. *In charge—C. J. Polinek.*

• PATTIN MFG. CO.

This exhibit will consist of a display of roof bolts featuring special items for low coal. *In charge—J. B. Dempsey.*

• PENN MACHINE CO.

Will exhibit typical replacement parts for current mining machinery, especially loading machines, cutting machines and haulage locomotives, and various types of "super-weld" rail bonds, including the reversible Everlast bond, and the wedge bond. Prominent among the replacements parts will be helical, bevel and spur gears and pinions, splined shafts, worms and worm gears, solid axle gears, continuous axle liners and many others. *In charge—S. Guy Little.*

• PENNSYLVANIA CRUSHER CO.

Will exhibit against a background of large photographs showing installation pictures of Pennsylvania Bradford breakers, ring hammer type granulators, and single roll crushers being used at various coal mines throughout the country, a number of scale models of some of the equipment illustrated. There will be bulletins and other photographs on hand and experts in attendance at all times to welcome visitors and endeavor to answer any questions regarding coal crushing equipment.

• PETERSON FILTERS & ENGINEERING CO.

Will feature a new filter for ⅛-in. by 0 coal, the Peterson TFR (top feed reservoir) vacuum filter. There will be a mechanically operated diagram cutaway model of this unit, showing how it works, along with the new exclusive technique of high frequency vibration on the filter deck. Flow sheets for the TFR's now in use or being installed, and also for the Peterson Disc filter, will be available. A vibrating section of the filter deck and screen will offer a boon to tired feet. *In charge—Robert J. Mattison, Jr.*

• PITTSBURGH GEAR CO.

Intend to exhibit various types and sizes of gears, using the guaranteed armored construction for long life and low maintenance costs. These gears will be conventional types used in mine locomotives, cutting machines, loading machines, tipples, and shuttle cars. On display also will be the taper serrated armature shaft, an exclusive Pittsburgh Gear Go. product. This construction eliminates keyways in both the shaft and the pinion eliminating breakage and adding greater strength to both. *In charge—E. R. Phillips.*

• PITTSBURGH SCREW & BOLT CORP.

A graphic display of "Pit-Bolts" for mine roof support will feature this exhibit. Production efficiency offered by the roof bolting system as compared with other methods for supporting mine roofs will be stressed.

"Pit-Bolts" will be displayed in both expansion-unit and split-rod types. With the expansion unit, a power wrench turns the bolt until the action of the expansion unit causes a firm grip to be formed in sound strata. The

split rod type is hammered into the hole until the action of the wedge expands the split rod which takes a firm hold in sound strata. *In charge—John J. Kelley and Richard W. Smith.*

• **POST-GLOVER ELECTRIC CO.**

Description not available.

• **PRECISION CHAIN CO.**

Will exhibit sections of Precision cutter chains, both for Ruckbuster-Multiplex and standard ½ by 1 bits, along with various chain links, bits, and other parts. *In charge—Frank L. Fulke.*

• **PRODUCTIVE EQUIPMENT CORP.**

A 4 by 10-ft single deck suspended GYROSET screen set up for coal dewatering on a suspension mounting will feature this exhibit. Also on exhibition will be one of the smaller units a 3 by 6-ft GYRETTE which can be used for minor sizing and dewatering jobs around the tipple or preparation plant, for either wet or dry sizing or dewatering. *In charge—L. H. Lehman.*

• **PROX CO., INC., FRANK**

This exhibit will feature the Prox Duomatic cutter chains manufactured for use of conventional or tungsten-carbide mine bits and the Prox tool steel throwaway mine bits. Cutter bars made for the various modern machines. Drive sprockets and various tungsten-carbide mining tools will complete the display. *In charge—Charles J. Forbes.*

• **PURE OIL CO.**

Feature attraction of the exhibit this year will be the introduction of a new line of industrial oils and greases. These products will be displayed in three white cabinets featuring colorful prints of three leading mining machine manufacturers' most modern equipment in three dimensional frames.

Also on display will be a continuous flow of the new Puroco series oil, featuring the non-forming properties that make it an excellent hydraulic oil. *In charge—R. F. Overlock, R. C. Osborne, R. W. Chamness and Paul Messinger.*

• **QUAKER RUBBER CORP.**

Will be ably represented by Messrs. C. Dugan, J. Alexander and W. Pender who will be glad to discuss any problems having to do with the utilization of rubber in the coal industry. *In charge—Charles Dugan.*

• **RAYBESTOS-MANHATTAN, INC.**

Manhattan Rubber Division

Feature of the exhibit will be an underground conveyor unit equipped with newest underground belt development, Ray-Man type F. Also on display there will be sizable samples of other types of coal mining belting equipped with several types of fasteners. Another product to be featured is the Buronik trolley wire guard, another Manhattan development to increase mine operator safety by preventing shock from contact with live trolley wires. An interesting exhibit of standard industrial rubber products consisting of transmission belts, V-belts, conveyor belts, hose, trolley wire guard and other products will round out the display. *In charge—P. L. Edwards.*

• **REICH BROTHERS MFG. CO.**

No description available.

• **RELIANCE ELECTRIC & ENGINEERING CO.**

Will exhibit "above-ground-use" electrical equipment. Ac and dc motors, gearmotors and V-S drive are among the products designed for increasing efficiency, conserving manhours, and lowering costs of "above-ground" coal mining operations.

A prime feature of the exhibit will be a spectator-operated display of reciprocating feed and vibrating conveyors equipped with Reliance V-S drive, which imparts to conveyorized coal cleaning and classification plants all the advantages of adjustable-speed control. Renewal parts for ac and dc motors will be displayed to show Reliance aid to organized maintenance programs.

A cut-away cross section of a Reliance precision-built ac motor illustrating various design developments and improved "in-built" performance features including the Reli-X insulation, prelubricated bearing construction, and motor lead indexing. *In charge—Charles E. Hugus, Jr.*

• **ROBERTSON CO., H. H.**

Will exhibit Galbestos roofing, siding and industrial ventilators. *In charge—Brighton P. Slutes.*

• **ROBERTS & SCHAEFER CO.**

Will present the Hardinge counter-current heavy-media separator to the coal industry. An actual machine will be available for inspection. Successful in iron ore preparation since 1949, this machine was not previously available for coal preparation.

Also on exhibit will be two R&S super-airflow pneumatic coal cleaners; a 6 by 12-ft machine for cleaning 9 minus ¼-in. coal and a 6 by 4½-ft unit for cleaning nut and pea coal; as well as an R&S hydrotator used to wet wash nut, stoker or slack coal below 2-in. size. *In charge—Edward C. Carris.*

• **ROEBLING'S SONS CO., JOHN A.**

Description not available.

• **ROME CABLE CORP.**

Will feature a complete line of Rome 60 portable cords and cables for mine use. A focal point will be an enlarged replica of the popular Rome 60 parallel duplex shuttle car cable. Descriptive literature and samples will be available.

• **RUST-OLEUM CORP.**

Feature attractions of this display are a demonstration of Rust-Oleum as put on over rusted metal and a motion display showing a large rusted panel, with a brush-on application of Rust-Oleum. There will also be literature in the booth available to interested visitors. A staff of four experts will be in attendance to discuss rust preventive measures with interested guests.

• **RYDIN RAILWAY EQUIPMENT CO.**

Will feature a display of mine car couplers in two sizes. The larger coupler weighs about 80 lbs, the smaller one seven lbs. Safety features of the Ryd-in automatic couplers are that they afford automatic coupling—manual guidance is not required. Helps prevent accidental separation of cars. Uncoupling rods are operated from the side of cars. Housing on coupler head helps prevent accidental separation of couplers or cars due to bad rail or derailments. They permit quicker shunting of cars at loading docks and in making up trains.

• **SAFETY FIRST SUPPLY CO.**

Will show a complete line of safety equipment for the mining industry. Among the new items on exhibition will be a laminated foil cloth, portable safety shields, gas indicators and alarms, miners caps and hats, models of eye protection, respirators, resuscitators, safety clothing and a goggle cleaning station. Also on exhibition will be a number of other items such as rail clamps, welding helmets, safety belts, yellow-flash lights, a portable drinking fountain and a self-contained breathing apparatus. *In charge —R. A. Phillips.*

• **SALEM TOOL CO.**

Will have a display of the McCarthy horizontal and vertical shot hole drills, McCarthy coal recovery drills and a display of large and small augers from 1½-48 in. diam. While each of the machines exhibited will be an improved model, the coal recovery drill will be an entirely new design featuring a multiple drilling head for single auger feed. *In charge—V. J. McCarthy and J. Wilson.*

• **SANFORD-DAY IRON WORKS, INC.**

Plans something new in a mine car display. It's so new and different that details will be withheld until unveiling at the show. This show marks Sanford-Day's 50th anniversary, devoting its entire capacity to the production of mine cars to meet the need of the coal industry.

• **SCHROEDER BROTHERS**

Will feature an all hydraulic roof bolting machine, crawler mounted, capable of drilling 60 deg angle holes and flexible enough for installing roof channels. *In charge —John S. Schroeder.*

• **SCREEN EQUIPMENT CO., INC.**

Is exhibiting a smooth running Seco vibrating screen. The screen which will be shown in operation is one of more than 300 different sizes and models made by this company and is a medium sized standard unit. Since they make screens only, their people are screen specialists. *In charge—C. S. Fielding and Nelson J. Gleiser.*

• **SECURITY LOCKNUT CORP.**

Will feature working models and a complete range of samples available for inspection and trial by mine operators and equipment manufacturers. Among the items on display will be various new devices which have been developed, some for the armed services and some for industry. *In charge—Cortlandt Symonds.*

• **SHELL OIL CO., INC.**

Will exhibit in an audience participation type of display industrial lubricants used by the coal industry. *In charge —E. D. Jette and "Zouch" Steelbach.*

• **SIMPLEX WIRE & CABLE CO.**

Present a complete line of insulated wires and cables for coal mine use. *In charge—E. J. MacKenzie.*

• **SIMPLICITY ENGINEERING CO.**

Will feature a horizontal screen and simplicity Os-A-Veyor feeder and conveyors. The feeder will be of the inertia driven type while conveyors shown will consist of both inertia driven and variable stroke mechanisms. All of this equipment will be mounted to operate under a burden of coal. Another machine to be exhibited will be the Simplicity Simpli-Flo single deck screen with ball tray deck attachment. This unit will operate independently from the other equipment and will have no coal passing over it. *In charge—J. C. Powlison.*

• **S K F INDUSTRIES, INC.**

Will exhibit a complete range of SKF ball and roller bearings and pillow blocks. Headquarters will be at Hotel Statler. *In charge—R. C. Fahy.*

• **SOCONY-VACUUM OIL CO., INC.**

Will emphasize the importance of correct lubrication to the coal mine operator. The four factors of correct lubrication: minimum power consumption; more continuous production; reduced maintenance costs; and lower lubrication cost spell out profit. The display will feature giant-size full color illustrations of mining equipment, cut away to reveal the working parts and the lubricating system. The exhibit will feature "Miss Gargoyle," particularly calculated to attract visitors to an audience participation test. *In charge—C. J. Copley.*

• **SOLVAY SALES DIVISION**
Allied Chemicals & Dye Corp.

(See Allied Chemical & Dye Corp.)

• **STANDARD DEVICES CO.**

Will display a line of standard trolley taps and standard cable protectors in an attractive exhibit with literature available to those present and mechanical devices to demonstrate the products. *In charge—Curtis R. Stoutenburg.*

• **STANDARD OIL CO. (INDIANA)**

Will feature oils and greases for lubrication of all types of equipment used in mining and processing coal. Lubrication engineers, concerned with problems of lubrication in the coal mining industry, will be present and ready to answer questions from visitors. *In charge—V. T. Miners.*

• **STANDARD OIL CO. OF OHIO**

Will show a table display of oils and greases by the mining industry, including some new types of greases. Representatives at the booth will answer any engineering lubrication problems which may arise in the minds of visitors to the Exposition. *In charge—M. R. Bower.*

• **STAR JACK CO.**

Will show two new mine jacks in their exhibit. One is a dual foot hydraulic timber setter and roof bolt drilling unit. The other is a hydraulic mine car straightener. The dual foot unit has a telescoping post with screw adjustment which can be tightened against the roof. This holds the timber unit rigid. The timber setter carries five tons on its head or one ton on its adjustable side bracket. The head can be used to push in roof bolts. *In charge—F. J. Jakoubek.*

• **STEARNS MAGNETIC MFG. CO.**

Will present a photographic exhibit featuring Stearns Magnetic equipment for tramp iron removal and heavy-media recovery. The booth is particularly designed to give guests a place to relax and discuss operating problems with company representatives. *In charge—R. H. Koehler.*

• **STERLING MOTORS CORP.**

Will feature a heavy duty dump truck of 161-in. wheel base powered with a 175 hp Diesel engine. The transmission will provide 10 forward speeds. The front tires will be single 12.00 by 26 16-ply and the dual rear tires 14.00 by 24 20-ply. The chassis will be equipped with power steering. The 10 cu yd capacity heavy duty body is built of heavy gauge steel, strongly braced to carry payloads of 15 tons and is mounted on a chassis equipped with alloy steel, heat treated frames lined with thoroughly seasoned hard wood to absorb road shocks and prolong the life of the vehicle. All crossmembers and brackets are fastened by means of bolts instead of rivets. Driver fatigue is reduced to a minimum through the use of long, wide, flexible front and rear springs, power steering and built-in cab comforts.

• **STERLING STEEL CASTING CO.**

Plan an exhibit consisting of all types of mine car wheels equipped with Sterling permanent grease seals, bearing adjustment and locking device, as well as miscellaneous castings for coal mining. A feature part of the exhibit will be two complete miniature mine car trips with locomotive. With these will be demonstrated the efficiency of operation of mine cars equipped with cast steel, balanced design wheels as against the inefficiency of the same number of cars equipped with conventional wheels. *In charge—F. E. Rhine.*

• **TALCOTT, INC., W. O. & M. W.**

Will exhibit the Talcott conveyor fastener suitable for all widths and thicknesses of rubber covered conveyor belting.

Talcott Acme patch fasteners are excellent for emergency and permanent repairs to ripped or torn conveyor belting. They are especially suitable in times like these when there may be a shortage of rubber belting. *In charge —M. W. Talcott and G. W. Little.*

• **TAMPING BAG CO.**

Will display seal-tight tamping bags made from wet strength paper which does not deteriorate when stored underground, where the humidity and moisture is high. Also featured will be a weed and brush killer, the latest and most effective chemical for controlling weeds and brush in mines and substations; also other right-of-ways that must be kept clean. *In charge—Alfred E. Pickard.*

• **TEMPLETON, KENLY & CO.**

Will display their complete line of Simplex jacks, specifically developed and used for coal mining purposes, for equipment with coal-cutting machines and for roof and timber supporting in mechanized mining. Featured will be the automatic ratchet lowering type for thin, medium and thick seams, ratchet and screw operating roof and timber jacks, and pin-up jacks; as well as specialized jacks developed specifically for various mining operations. A new line of "Re-Mo-Trol" hydraulic pumps and remote controlled rams for pushing, pulling and lifting operations will also be featured as a new line of units with wide application in mining for such operations as testing mine roof bolts, pulling and lifting beams for alignment, straightening frames and parts on damaged equipment, lifting and lowering mine cars, locomotives and other machinery, pushing or pulling pins, bushings and sleeves. *In charge—P. H. McManus.*

• **TEXAS CO.**

Will feature a new background displaying prominent Texaco products used by the coal mining industry. *In charge—F. M. Pobst.*

• **TIDE WATER ASSOCIATED OIL CO.**

Will exhibit a complete line of lubricants for the coal industry. *In charge—H. M. Wiltsie and F. C. Lempert.*

• **TOOL STEEL GEAR & PINION CO.**

Plan a 10 by 20-ft display containing many cutaway samples of products manufactured for coal mining machinery, and photographs of the different types of coal mining machinery where "Tool Steel" parts are used. One of the features of the exhibit will be the tool steel mystery gear which continually revolves with no apparent means of motivation. Available will be many types of bulletins of the machines and products used in underground, strip and coal preparation plants. *In charge— C. R. Burrell.*

• **TRABON ENGINEERING CORP.**

Will feature fully automatic lubrication systems for loaders and shuttle cars. The automatic Trabon "hydralube" pump is powered from the hydraulic system of the unit being lubricated. On the shuttle cars 65-70 points are covered by the system including the wheel drive units and the worm gear reduction unit. Grease is used as a lubricant and the later units are completely filled. As the unit operates the excess grease acts as a seal to exclude water and grit. One—one and a half lbs of grease are used per 100 tons of coal handled. Results show increased tonnage, greatly reduced maintenance and elimination of the hazards of manual lubrication. *In charge—Wilbur Deutsch.*

• **TRACY CO., BERTRAND P.**

Description not available.

• **TWIN DISC CLUTCH CO.**

Will display a plastic working model of the Twin Disc three stage hydraulic torque converter of the type currently used in heavy construction machinery and off-highway trucks. Additional units which will be on display are aluminum hydraulic couplings, Hydro-Sheave drives, friction clutches, and hydraulic power take-offs. Near life size cut-away drawings of these same units will form an integral part of the exhibit back drop. District and factory personnel will be on hand to discuss design features and performance data with interested parties with the aid of a Vu-Graph machine and picture screen. *In charge—G. W. Upp.*

• **TYLER CO., THE W. S.**

Will feature a large Ty-Rock (vibrating) screen of the type used in the coal industry. A Ro-Tap testing sieve shaker and Tyler standard screen scale testing sieves along with a large selection of woven wire screens will also be shown in the exhibit. *In charge—H. F. Lawrence.*

• **UNION WIRE ROPE CORP.**

Will exhibit a realistic miniature of the Union Wire Rope factory with scale model trains hauling raw materials into the plant from one side and picking up the finished product on the other side of the factory, then delivering it to all the different fields of usage. It has been conservatively estimated that this display has more than a thousand working parts. *In charge—M. B. Hansell, Sr.*

• **U. S. BUREAU OF MINES**

No description available.

• **U. S. RUBBER CO.**

Electrical Wire & Cable Dept., Mechanical Goods Division

Both the wire and mechanical goods division will be exhibiting. Highlight of the machanical goods division will be a demonstration of how a rubber and fabric conveyor belt is actually spliced in the field. A portable vulcanizer will be set up at the show for this purpose and experts will go through the steps needed to attain a strong enduring splice, including vulcanizing. The product display will include hose, tape, packing, V-belts, conveyor belting, molded specialties, and Uskon conductive rubber heating pads.

The wire division will exhibit the following types of electrical wire and cable: machine and locomotive cables, mine telephone cables, bore hole and shot firing cables, shovel and dredge cables. *In charge—W. A. Tipton and H. J. MacDonald.*

• **U. S. STEEL CO.**

Will feature their products applicable to the coal mining market of the several subsidiary companies. Among these are: American Steel & Wire Co., Columbia Steel Co., Cyclone Fence Division, American Steel & Wire Co., National Tube Co., Tennessee Coal, Iron & Railroad Co., U. S. Steel Co., U. S. Steel Export Co. and the U. S. Steel Supply Co. *In charge—John Graham.*

• **UPSON-WALTON CO.**

Will feature an exhibit of Upson-Walton brattice cloth, wire rope and fittings. *In charge—E. D. Baskin.*

• **VASCOLOY-RAMET CORP.**

Plan to exhibit a general line of cemented carbide mining tools including straight shank, shoulder type and continuous miner type chain bits, also hand held or mounted auger drills and roof drills. A feature of the exhibit will be the differential in the design of an auger drill when mounted as compared with the hand held type. *In charge—R. O. Moore.*

• **VICTAULIC CO. OF AMERICA**

Will display its complete line of Victaulic pipe couplings, ranging from ¾-in. through 60-in. diam, its modern full-flow elbows, tees, reducers, and valves. Also on exhibition will be Vic-groovers, ratchet type, hand operated, ranging in sizes ¾-6 in. and the Vic-power groover which cuts and grooves the pipe simultaneously and automatically, for the installation and operation of water supply, spray, drainage, sludge, and all other types of pipe systems for mine and preparation plants.

Operating units carrying air pressure will demonstrate the speed, simplicity, flexibility and leak tightness of Victaulic joints. *In charge—R. W. English and Frank Costanzo.*

• **WATT CAR & WHEEL CO.**

Plan to show at Cleveland a large eight-wheel mine car to be used in the new mine of the Southwest Potash Corp., Carlsbad, N. M. The car is built of high tensile steel plates and will have the cast spring plankless truck as manufactured by National Malleable & Steel Castings Co. It will be equipped with Willison automatic couplers and instead of draft springs will have the special rubber draft gear, manufactured by the same company. Wheels will be alloy cast steel with heat treated tread and flange, manufactured by the Mountain State Steel Foundries Co. *In charge—R. L. Edgar.*

• **WEDGE BAR SCREEN CORP.**

No description available.

• **WEDGE WIRE CORP.**

Will display Kleenslot wedge wire screen in the different wire sizes and profile. The method of installing wedge wire on a vibrator without material change to the present method will be a feature of the exhibit. *In charge—W. E. Bixby.*

• **WELLMAN CO., S. K.**

No description available.

• **WESTERN CARTRIDGE CO.**

Division of Olin Industries, Inc.

Will display a complete line of blasting caps and dynamites. The exhibit will show blasting caps of all kinds manufactured by Western Cartridge Co. and dynamites manufactured by Columbia Powder Co. and Equitable Powder Co. A products institutional theme will be depicted by means of a centrally located turntable carrying five display units featuring the products manufactured by the various Olin divisions, subsidiaries and affiliates. *In charge—A. J. Barocca.*

• **WESTERN MACHINERY CO.**

Feature attraction of this exhibit will be a simulated coal washing operation in a plastic, model Wemco Mobil-mill incorporating a Wemco drum separator to effect heavy-media cleaning action. Also on display will be a Wemco coal spiral, laboratory and commercial-sized Fagergren flotation machines, and Wemco heavy-media equipment used in coal cleaning operations. To challenge operating knowledge of the mining industry, prizes will be given to booth visitors who successfully participate in a noval WKE game. *In charge—R. W. Hernlund.*

• **WESTINGHOUSE ELECTRIC CORP.**

Will feature a new Power Center, a new switch house and a new selenium rectifier. Outstanding will be a new Lo-Liner Locomotive in operation. There will also be electric motors and control; trolley line material; gearing; "De-Ion" circuit breakers and lighting. *In charge—J. R. Fulton.*

• **WEST VIRGINIA STEEL & MFG. CO.**

Will show a light rail model of prefabricated track, with switches equipped with special rerailers. They will also show their line of standard mine ties, including the composite wood-steel tie.

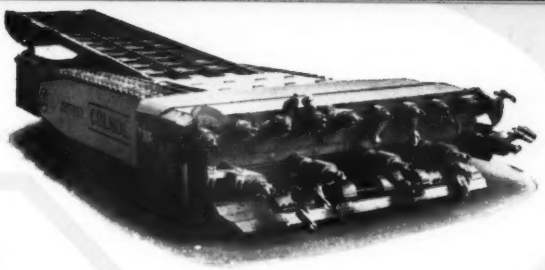
Light and heavy switch stands will be shown including a new heavy cam motion parallel throw stand. Also on exhibition will be a newly redesigned manganese steel frog. On display for the first time will be the new West Virginia self-contained hydraulic rail bender. The exhibition will be rounded out with a full line of both wedge and expansion unit type roof bolts with washers, plates and roof ties. *In charge—J. B. Haskell.*

• **WHITNEY CHAIN CO.**

No description available.

"COLMOL" CONTINUOUS MINING MACHINE

Various models for mining and loading from 3 to 5 tons per minute without the use of explosives. Mines an entire room 9'6" wide, with varying heights—advancing at the rate of 24" per minute or more. Two models will be displayed—don't miss them.



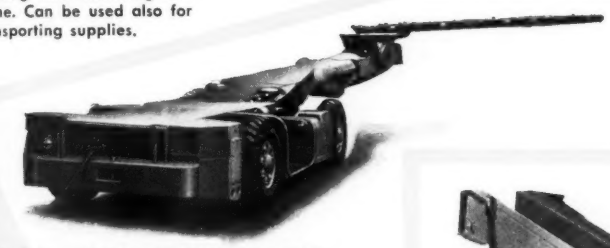
DRILLING MACHINES

Types 56-FHR or RDR for off-track mining. Can be equipped with arms for horizontal or roof drilling.

JEFFREY SHOWS ADVANCED MINING EQUIPMENT DURING COAL SHOW

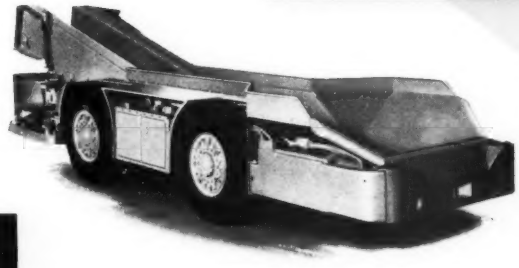
SHORTWALL TRUCK

For transporting any type of SHORTWALL cutter. Tilting pan facilitates loading and unloading machine. Can be used also for transporting supplies.



70-UR UNIVERSAL CUTTER

Cuts any place in the seam, including shearing. Completely hydraulic in operation. Furnished in 30" and 34½" heights, with single or dual drive wheels. You'll like the flexibility of the 70-UR—see it in action.



SHUTTLE CARS

Cable reel types with varying heights. Two wheel drive with two wheel steering, or four wheel drive with four wheel steering. All sizes with elevating discharge. Operator's deck either left or right side.

SEE JEFFREY FIRST

BOOTHS 2543-2655

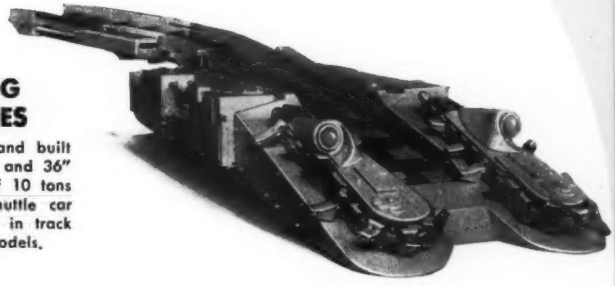
• Under present conditions the Coal Operator is obliged to mechanize, of necessity, if he is to compete favorably in today's and future markets.

To help produce better coal—faster—and at lower cost, Jeffrey offers a complete line of modern mining machinery. Many of these units will be on display during the Show. Stop in and become conversant with the numerous advantages they provide. Consult a Jeffrey Engineer for suggestions as to how this equipment may be best applied to your operation.

Ample literature covering each of the units will be available.

LOADING MACHINES

Crawler mounted and built in heights of 28" and 36" with a capacity of 10 tons per minute for shuttle car loading. Available in track and rubber tired models.



72-AR ELEVATING CONVEYOR

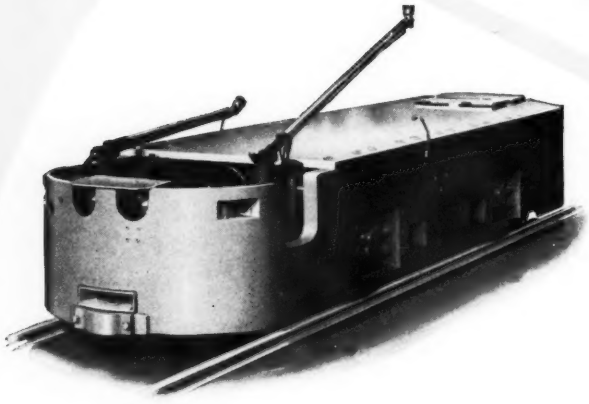
For use with shuttle cars or conveyors. Discharge height is adjustable to suit car height. Can also be furnished with steel flanged wheels for riding rails or with implement type wheels.

JEFFREY Equipment for

FOR TRACK MINES

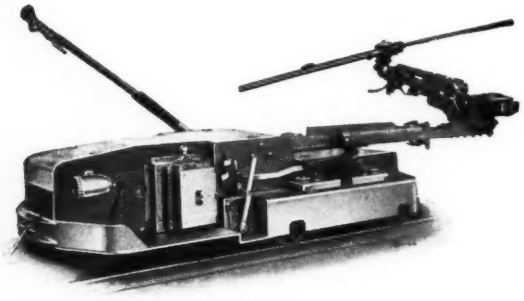
UNIVERSAL CUTTERS

Hydraulically operated and track mounted, the Jeffrey 29-U Universal cutter cuts anyplace in the seam—top, bottom, center and shearing. Only 33½" high above rails.



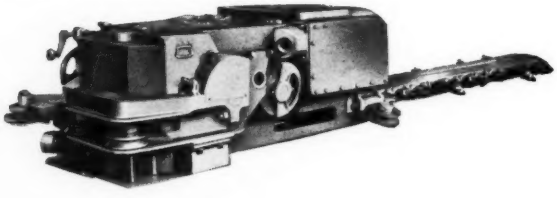
ELECTRIC LOCOMOTIVES

Built in a wide variety of types and sizes, for either trolley or storage battery operation. Feature round end, "armor plate" steel frames, anti-friction journal boxes and motor axle suspension; handwheel, air, dynamic or hydraulic brakes.



DRILLING MACHINES

Types 56-A, 56 FH and 56 RD for track operation. Can be furnished with mechanically or hydraulically operated arms for horizontal drilling and hydraulically-operated arm for roof drilling and bolting.



SHORTWALL CUTTERS

Series 35 in various types with either 35 or 50 H.P. motors for conveyor mining or equipped with trucks.

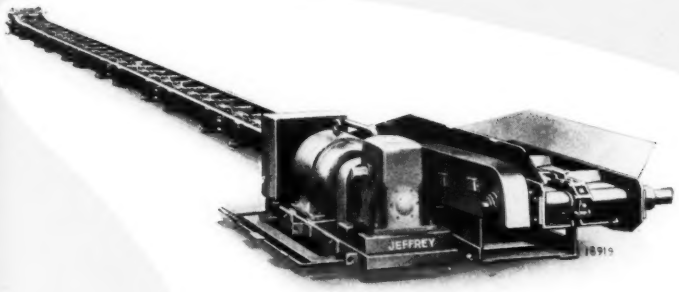
HIGH CAPACITY LOADING MACHINES

Track mounted, hydraulically controlled units for high capacity loading. Two types: L-500 for the low vein seams and the L-600 for mines permitting the use of higher units.

492-45

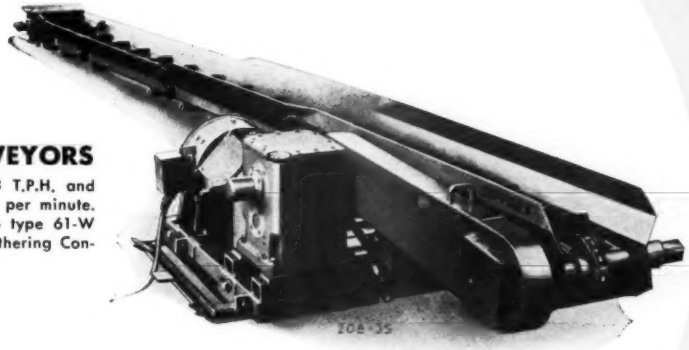
Modern Coal Mine Operation

UNDERGROUND CONVEYORS (Sectional Types)



FACE CONVEYORS

These conveyors are built to take the excessive abuse at the face. Type 61-HG shown has maximum length of 90 feet with a capacity of one ton per minute. Also type 61-AF face conveyor for lighter work but interchangeable with the 61-AM.

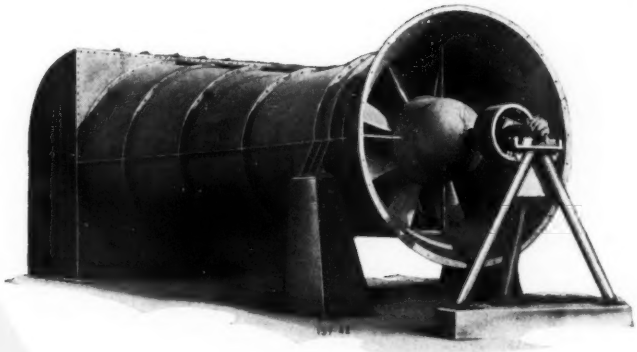


ROOM AND GATHERING CONVEYORS

Various types with capacities from 1 to 3 T.P.H. and standard chain speeds from 90 to 140 feet per minute. Type 61-AM Room conveyor is shown. Also type 61-W room or gathering conveyor and 61-WH Gathering Conveyor as well as Elevating Conveyors.

GATHERING OR HAULAGE CONVEYORS

Sectional Belt Conveyors are used where coal must be transported over long distances beyond limitation of chain conveyors. In three widths for belts 26", 30" and 36" wide—have been operated in lengths exceeding 3,000 feet on the level. Large capacities.



FANS AND BLOWERS

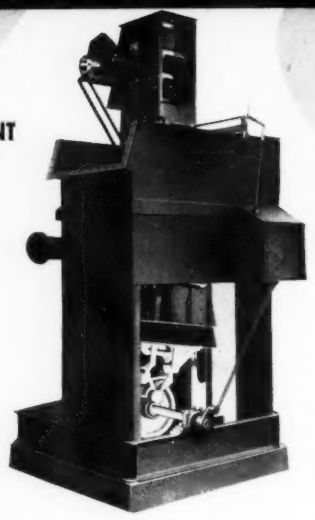
Jeffrey "AERODYNE" mine fans provide the highest efficiency in ventilation, insuring an abundant supply of fresh air when and where needed most. A range of sizes to meet capacity requirements up to 500,000 C. F. M. Portable Blowers also available for blowing fresh air to dead ends through flexible tubing. "AERODYNE" midget type shown at the right.

JEFFREY

Serves the Coal Industry

COAL PREPARATION EQUIPMENT

JEFFREY ONE COMPARTMENT DIAGRAM JIG



PREPARATION EQUIPMENT

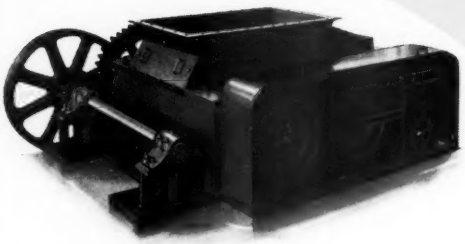
Jeffrey one compartment Diaphragm JIG with 25 sq. ft. of screen area.

Jeffrey Baum and Diaphragm Jigs represent the most effective high capacity mechanical coal cleaning units on the market today. Proved design—carefully designed—no pre-sizing necessary. Single or multiple compartments.

Air-operated Baum Jigs—for capacities up to 700 T. P. H.

Diaphragm Jigs—for capacities up to 200 T. P. H.

Also Unit Washers for washing up to 200 T. P. H. These units combine a Diaphragm Jig with a self-contained dewatering and sizing screen, and water clarifying tank.

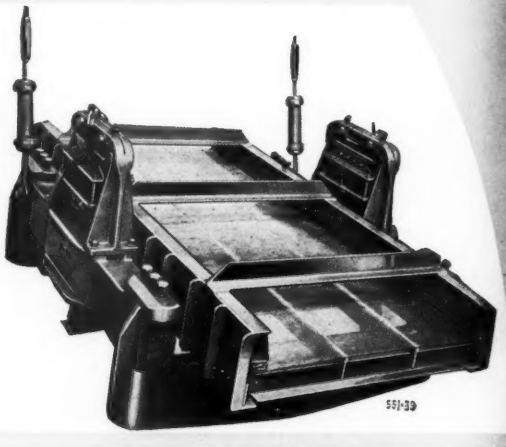


CRUSHERS

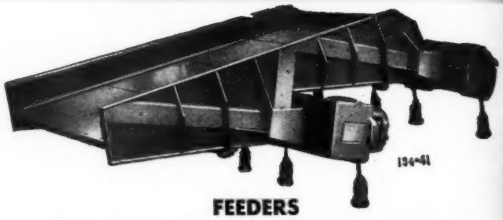
Heavy duty Double Roll machines for large capacities. Adjustable to provide a product range from 4" to 12". Crush anything that comes from mine face—capacities up to 1,800 T. P. H. depending upon size of product. Large size—30" x 36" — double roll Crusher shown.

SCREENS

Single or multiple deck electric vibrating Screens for any screening requirement. Also "CONVEY-ANSCREENS," Feeders, Bin Check Valves, etc.



551-39



134-41

FEEDERS

Electric vibrating types for providing absolute control over tonnage handled in feeding operations. Used for feeding crushers, belts, jigs, etc. Also mechanical feeders and conveyors.

BELT IDLERS

Roller or ball bearing troughing and Return Idlers for belts from 14" to 60" wide. Jeffrey Belt Conveyors are being widely used in both coal and metal mining operations.

APRON CONVEYORS

Jeffrey steel apron Conveyors are used for conveying, feeding, and for picking table and loading boom service. For large carrying capacity the steel apron conveyor is in a class by itself. Also

THE JEFFREY MANUFACTURING COMPANY

Established 1877

General and Export Sales Offices

COLUMBUS 16, OHIO, U. S. A.

DISTRICT SALES OFFICES

BALTIMORE 2, MD. Munsey Bldg.
BECKLEY, W. VA. 403 City Ave.
BIRMINGHAM 3, 2210 Third Ave., N.
BOSTON 16, 38 Newbury Street
BUFFALO 2, Jackson Building
CHICAGO 1, Bell Building
CINCINNATI 2, Carew Tower
CLEVELAND 15, 1560 Hanna Bldg.
DENVER 2, Ernest & Cranmer Bldg.
DETROIT 13, 5808 St. Jean Ave
HARLAN, Kentucky
HOUSTON 2, TEXAS City National Bank Bldg.
JACKSONVILLE 2, Barnett Bank Building
MILWAUKEE 2, 735 N. Water Street
NEW YORK 7, 30 Church Street
PHILADELPHIA 3, Broad St. Station Bldg.
PITTSBURGH 22, Oliver Bldg.
SALT LAKE CITY 1, 101 W. 2nd South St.
ST. LOUIS 1, Railway Exchange Bldg.
SCRANTON 3, 122 Adams Avenue

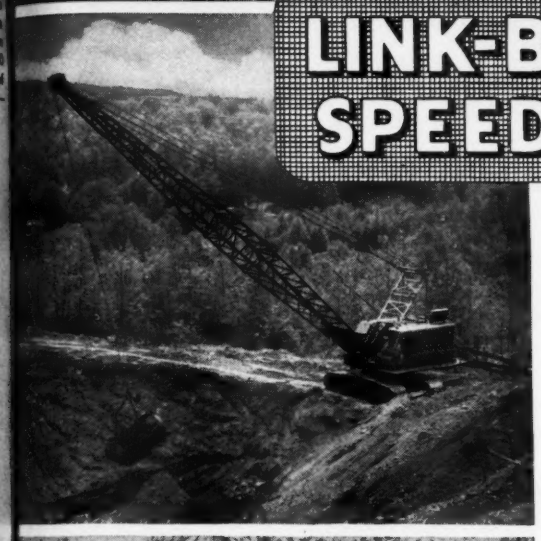
SERVICE STATIONS

BIRMINGHAM • PITTSBURGH • JOHNSTOWN • SCRANTON • MT. VERNON, ILL. • HARLAN, KY. In West Virginia: BECKLEY—CABIN CREEK—LOGAN—MORGANTOWN—WELCH

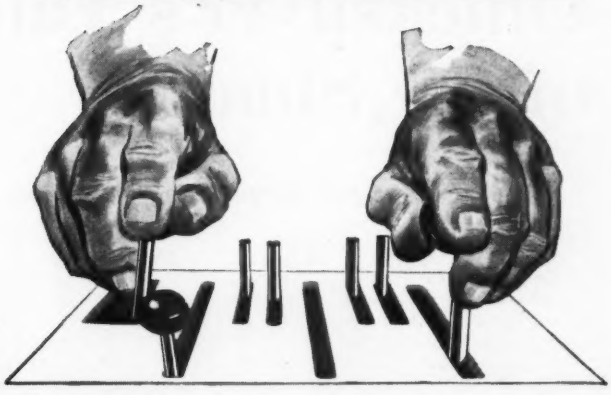
ASSOCIATED COMPANIES

JEFFREY MFG. CO. LTD., Montreal, Canada
JEFFREY-GALION (PTY.) LTD., Johannesburg, S. A.
THE OHIO MALLEABLE IRON CO., Columbus, Ohio
BRITISH JEFFREY-DIAMOND LTD., Wakefield, England
THE GALION IRON WORKS & MFG. CO., Galion, Ohio
THE KILBOURNE & JACOBS MFG. CO., Columbus, Ohio

LINK-BELT SPEEDER



At your finger tips . . . up to 25% increased output with SMOOTHER, EFFORTLESS, *Speed-o-Matic* CONTROLS



FINGERS instead of muscles do the work with Link-Belt Speeder's exclusive Speed-o-Matic* controls! Every move of the Shovel or Crane is faster, more accurate, easier. You get "pin point" placement of bucket, shovel or hoe. No drag or lag, no jerk or jump. You "feel the load" every inch of the way—smoothly, surely, safely.

As for your operator, what a difference this control makes! He's fresh and fit, even during long overtime. And he lifts, loads and swings with a tireless precision that pays off in greater output, more profits for you.

Whether stripping overburden, digging out a seam or loading, you get consistently higher and more economical production with a Link-Belt Speeder.

**Available on 51, 300 and 500 Series.*

VISIT THE LINK-BELT SPEEDER BOOTH, No. 108

In the Arena—Main Floor

AT THE COAL SHOW—CLEVELAND—MAY 14 TO 17

LINK-BELT SPEEDER CORPORATION

Builders of the most complete line of shovels, cranes and draglines

CEDAR RAPIDS, IOWA

12.404

Raising cattle keeps wolf from the door at Knoxville, Calif., mercury mine

Quicksilver's Valley of the Shadow

By WORTHEN BRADLEY
President
Bradley Mining Co.

Several Ways to Earn a Living

IN the upper reaches of the Amazon there lives a race of three-armed men who walk on stilts and have heads like crocodiles. Fantastic, you say? Impossible, you insist? You're absolutely right! But you must excuse the vaporings of one who has lived with (and on) the U. S. quicksilver industry for the past 25 years. After that roller-coaster existence the mind is capable of imagining anything, from pink elephants to blue cinnabar.

The time has come to take pen in hand on this subject. We have seen three cyclical upswings in the quicksilver price—World War I, the late '20's, and World War II—and here we go again.

This piece could also be titled "Several Ways to Earn a Living." For the various units of the domestic quicksilver industry, one of the best ways to stay solvent in recent years was *not* to attempt production of the metal. There is one notable exception to this depressing generalization. The Sonoma quicksilver mine, in California, has continued producing steadily —to its own amazement, perhaps. More power to Sonoma, but for the purpose of this treatise let us consider that property the exception to the rule.

The dark days for quicksilver began in 1947, when the price of the metal went into a rapid decline from its postwar levels of $100 and up per flask. The decline continued through the following two years, with a temporary alleviation in late 1948 and early 1949 when, owing to European cartel action, our price went to more than $90. But the interrupted decline soon resumed its downward way, and the price hit bottom at about $70 in mid-1950. During the latter part of 1950 European price boosting again reversed our price trend. The domestic price responded as expected, and passed $100 in November. More of this later.

How have our mines been sustaining themselves during these lean years? The question should probably be rather how have they *attempted* to sustain

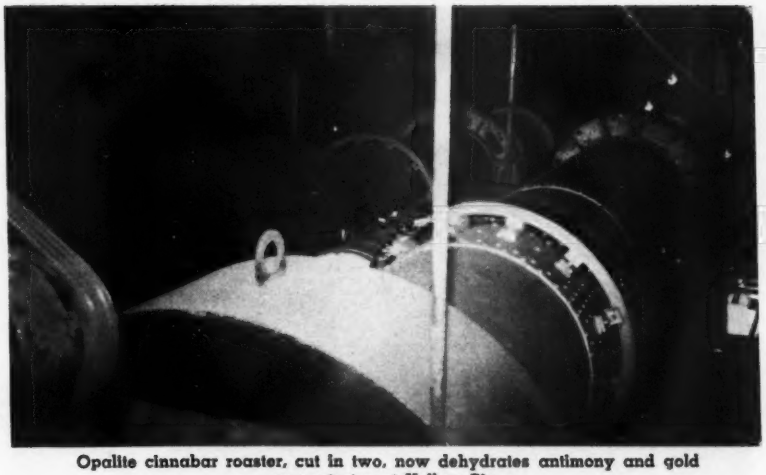
Hermes mine dwellings are rented to families from Yellow Pine mine near Stibnite, Idaho

themselves—for it is the rare property that has been able to make back its "shut-down expenses." These costs usually included at the most a watchman and the barest minimum of maintenance work. Any real maintenance, such as continued dewatering of underground workings, has been allowed to go by the boards.

So the goal to shoot at has been a $500 to $1500 monthly cost. It might seem a modest undertaking to win back an amount in this range, but it has not been uniformly easy for a small quicksilver mine—usually somewhat isolated and underequipped—to accomplish this. Following is a list of seven different ways in which these properties are known to have attempted to keep the wolf from the door and the landlord (i. e., owner—where the ground is leased) in his place. Some of these endeavors are pictured in the accompanying photographs.

(1) The land is put to use for cattle grazing—or all or part of it is leased or sold for that purpose. Examples in California are the Knoxville and Sulphur Bank mines. This involves little or no disturbance to existing mine buildings and equipment.

(2) The property is converted to a resort. The one example known at the moment is the transformation of the Mirabel mine, near Middletown, in Lake County, Calif. This ex-quicksilver producer has become the "Mirabel Springs Rancho"; an enterprise which, by means of elaborate roadside advertising, proclaims "Everything Served Here Raised on Ranch." The particular pride of Mirabel's menu is the product of its own trout farm. Mirabel is pretty thoroughly converted and would be difficult to bring back as a producing mine.



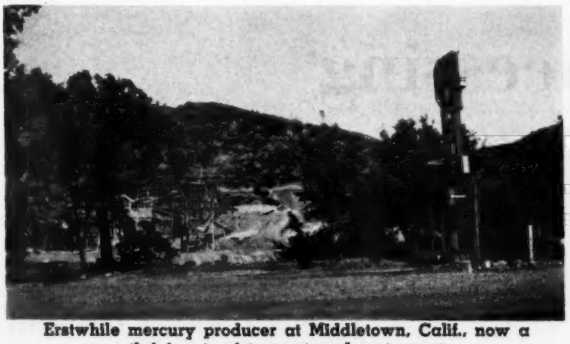
Opalite cinnabar roaster, cut in two, now dehydrates antimony and gold concentrates at Yellow Pine

(3) The sale of commercial rock for road metal and similar purposes. All quicksilver mines have, from time to time, sold calcined furnace output from their "slag dumps." Such sales have usually been to the county, and lateral roads surfaced with the reddish rock are a familiar sight in the vicinity of the mines. These sales have been pushed in recent years, in some instances to the extent that once-bulky dumps have been completely removed.

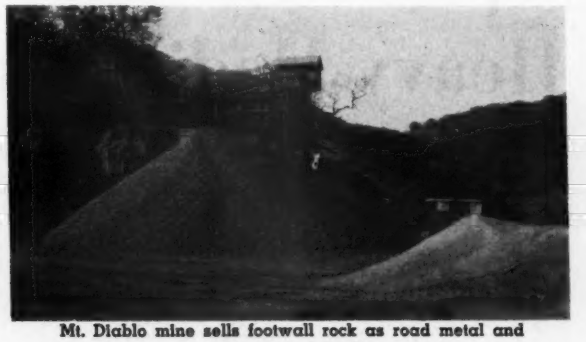
At least one property has gone further in this direction. The Mt. Diablo mine (California) built a crushing and screening plant to produce graded rock sizes from 2½ in. on down. This "rock plant," constructed in 1945, has run when the right price could be secured for its product, the competition being very aggressive. Feed for the plant has come from open-cut mining of the hard sandstone footwall of the "silica carbonate" (quicksilver ore rock).

(4) An extension of this policy is use of dump material for light-weight

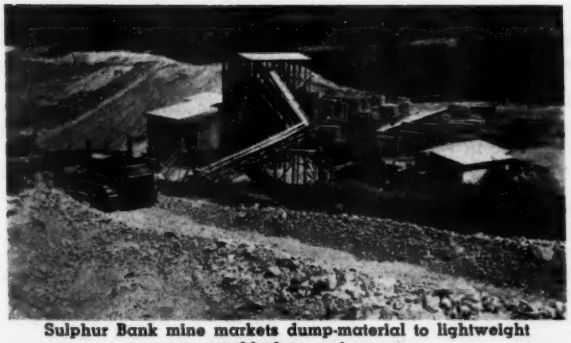
(*Continued on page* 91)



Erstwhile mercury producer at Middletown, Calif., now a thriving tourist resort and restaurant

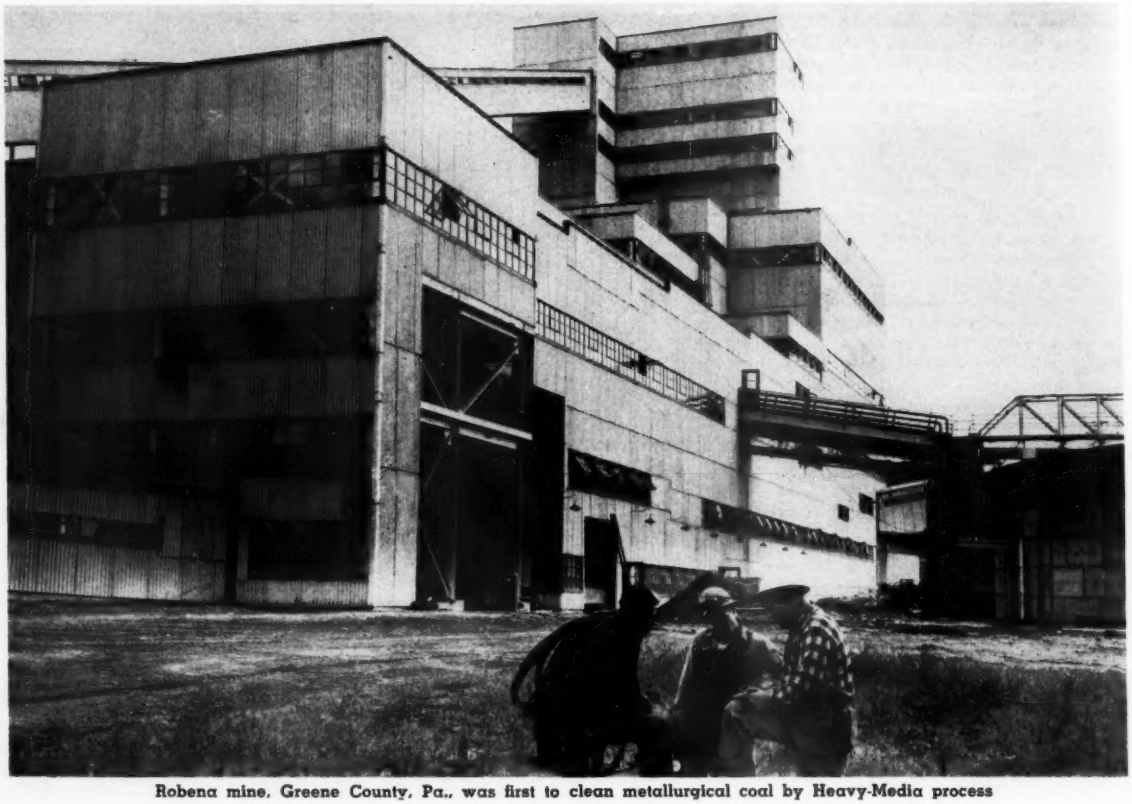


Mt. Diablo mine sells footwall rock as road metal and concrete aggregate



Sulphur Bank mine markets dump-material to lightweight concrete block manufacturers

In Douglas County, Ore., mercury miners are now in the logging business



Robena mine, Greene County, Pa., was first to clean metallurgical coal by Heavy-Media process

Operating Factors in Heavy-Media Processing*

Part II—As Operating Experience Increases Field of Application Grows Wider

By L. J. ERCK
Chief Metallurgist,
Cleveland-Cliffs Iron Co.

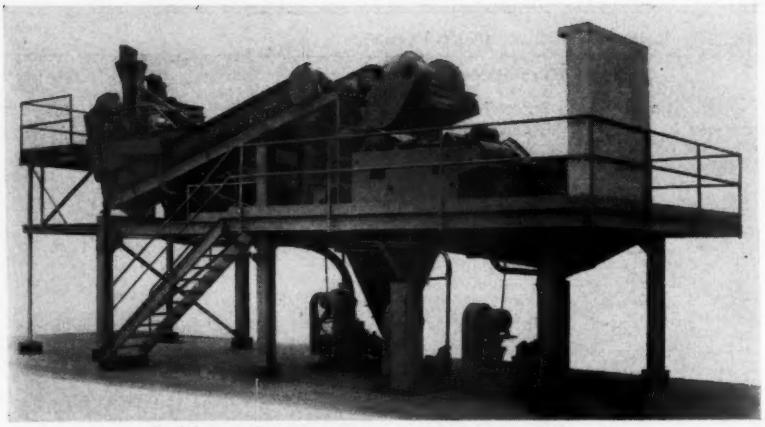
IT has long been realized that it would be highly advantageous to be able to make a three-way separation, particularly in one vessel. The author has long challenged this thought and is reluctant to admit that it is possible to make three clear-cut products from one separator, primarily a concentrate, middling and tailing, unless close sizing is practiced. It is an established fact that the specific gravity and viscosity of the media along with the cfs velocity, either horizontal or vertical, will satisfy only one size particle. Particles over and under this critical diameter must suffer in efficiency and the wider the spread the greater the overlap. The settling time in such a suspensoid has an established differential in time rate from the finest particle being treated to the largest. If the velocity is such that the fine particles do not have enough resident time in order to reach the lower zones of the separatory vessel, then they are certain to report as float material. This and other factors controlling Heavy-Media separation do not make it practical to attempt three-way separation simultaneously in the same vessel. Ways and means may be determined for increasing the efficiency of a possible three-way separation to a point where it would be attractive, particularly if the metallurgical problem so dictates.

Such a case has been advanced on one property and was reported in a paper by H. H. Vogel of Barton Mines Corp., North Creek, N. Y., and E. C. Bitzer of the Colorado Iron Works Co., Denver. In this installation a 54-in. Akins separator replaced an open-top cone having an external air lift. The Akins separator was so designed as to make a middling product as well as the sink and float products. Here is a specific instance in which a three-way separation plays an important part in milling and assisted in solving a difficult metallurgical problem. The middlings in this case were screened, with the

* Part I of this important article appeared in the January 1951 issue.

TABLE I—HMS PLANTS IN OPERATION

Name	Plant Location	Vessel	Feed Rate Tons/Hr.	Size Range	Starting Date	Specific Gravity
COAL—BITUMINOUS						
Pittsburgh Coal Co.	McDonald, Pa.	Link-Belt	250	3 x ¼	2/46	1.60
Pittsburgh Coal Co.	McDonald, Pa.	Link-Belt	250	8 x 3	3/49	1.60
H. C. Frick Coke Co., Robena Plant	Greensboro, Pa.	1-20′ Cone	600*	3 x ¼	11/48	1.55
		1-20′ Cone	525	3 x ¼		1.35
Clean Eagle Coal Co.	Huffsville, W. Va.	7′ Mobil-Mill	60	2 x 3/16	1/49	1.50
Central Sand & Gravel Co., Inc.	Eckhart, Md.	7′ Mobil-Mill	75	3 x ⅛	3/49	1.50
Penna. Coal & Coke Corp., No. 46 Mine	Winburne, Pa.	10′ Cone WKE	150	4 x ¼	3/49	1.45
C. E. Campbell Coal Co.	Treveskyn, Pa.	7′ Mobil-Mill	60	2½ x ¼	3/49	1.60
R. P. M., Inc., Joliana Mine	Dequoin, Ill.	7′ Mobil-Mill	60	4 x ⅛	4/49	1.50
Nugent Mining Co. Rattlesnake Mine	Lane Mills, Pa.	7′ Mobil-Mill	80	2½ x ¼	4/49	1.45
U. S. Coal & Coke Co., Alpheus Plant	Gary, W. Va.	Akins	200	2 x ¼	4/49	1.46
Hensies	Belgium	7′ Mobil-Mill	50	10 x 2.5mm	5/49	1.50
Simpson Creek Collieries	Galloway, W. Va.	10′ Mobil-Mill	150	2 x ⅝	6/49	1.43
Youngstown Mines Corp.	Dehue, W. Va.	Davis	350	4 x ¼	8/49	...
Riddlesburg Mining Co.	Riddlesburg, Pa.	7′ Mobil-Mill	50	4 x ⅛	8/49	1.42
Mid-Continent Coal Co.	Marissa, Ill.	10′ Mobil-Mill	125	4 x 9m	11/49	1.50
Belle Valley Coal Co.	Belleville, Ill.	7′ Mobil-Mill	60	3¼ x 10m	9/49	1.50
Jones & Laughlin Steel Co., Vesta Plant	Brownsville, Pa.	8 Link-Belt	2000*)	5 x ¼	1/50	1.55
		6 Davis	1500*)			1.35
Houilleres du Nord	Dovai, France	Davis	100		4/50	...
Evan Jones Coal Co.	Anchorage, Alaska	7′ Mobil-Mill	50	3½ x ¼	1/50	...
Regie des Mines de la Sarre	Sarre, France	Davis	350	80mm x 10mm	4/50	...
Pocahontas Corp.	Amonate, Va.	2 Link-Belt	130		5/50	1.35
Central Coal Co.	Monterey, Tenn.	7′ Mobil-Mill	50	4 x 3/16	5/50	...
COAL—ANTHRACITE						
Rhoads Contracting Co.	Mahanoy City, Pa.	Link-Belt	250	4¾ x ⅛	12/48	1.73
Gilberton Coal Co.	Girardville, Pa.	10′ Mobil-Mill	120	7/16 x 3/32	4/49	1.88
SPODUMENE						
Lithium Corp. of America, Inc.	Rapid City, S. D.	5′ Mobil-Mill	12	x 10M	11/48	
IRON ORES						
Butler Bros., Patrick Plant	Cooley, Minn.	2-78″ Akins	360	1⅝ x ¼	1945	2.80-3.20
Butler Bros., Harrison Plant	Cooley, Minn.	Hardinge	260	1⅝ x 3/16	1939	3.10
Mesabi Cliffs Mining Co. (Hill-Trumbull)	Calumet, Minn.	Hardinge	300	1½ x ⅜	5/45	
Mesabi Cliffs Mining Co. (Holman-Cliffs)	Taconite, Minn.	2-78″ Akins	440	.....	6/49	...
Rhude & Fryberger	Ironton, Minn.	10′ Mobil-Mill	100	3 x ⅛	9/48	2.90-3.00
Pacific Isle Mining Co.	St. Louis City, Minn.	Hardinge	50	1½ x 3/16	8/48	2.80-3.00
Stanley Mining Co., Mary-Ellen Unit	Biwabik City, Minn.	66″ Akins	126	¾ x ¼	8/48	
Sloss-Sheffeld Steel & Iron Co.	Franklin City, Ala.	10′ Cone WKE	75	2 x 10M	8/47	2.55-2.65
Algoma Ore Properties, Ltd.	Soo, Canada	12′ Cone	120	1½ x 8M	7/46	3.10-3.30
		6′ Cone	20	8M x 60M	7/49	3.00
Hanna Ore Mng. Co. (Buckeye Mine)	Coleraine, Minn.	Akins	190	1½ x ¼	3/45	3.25
Lone Star Steel Co.	Daingerfield, Tex.	7½″ Cone	150	2-3/16	1944	3.0
Inter-State Iron Co. (Grant Mine)	Buhl, Minn.	10′ Mobil-Mill	150	1½ x ⅛	8/49	...
Hanna Coal & Ore Corp. (Maroco Mine)	Crosby, Minn.	Wemco Drum	135	2 x 3/16	9/49	...
Zontelli Bros.	Ironwood, Mich.	7′ Mobil-Mill	100	1¼ x 3/16	10/49	...
Shook & Fletcher Supply Co.	Russellville, Ala.	10′ Mobil-Mill	100	.....	11/49	
Stripa Gruvaktiebolag	Ludvika, Sweden	7′ Cone Wemco Design	50	50MM x 5MM	1/50	3.20
ZINC AND ZINC-LEAD ORES						
American Zinc Co. of Tenn.	Mascot, Tenn.	1-10″ Cone	165	2 x ¼	3/36	2.73
Eagle-Picher Mining & Smelting Co.	Cardin, Okla.	1-19″ Cone	400	1½ x 3/16	2/39	2.69-2.84
Kootenay Belle Gold Mines, Ltd. (Retallack Mines, Ltd.)	Kaslo, B. C.	10′ Mobil-Mill	40	1½ x 8M	5/50	2.80
FLUORSPAR ORES						
Rosiclare Lead & Fluorspar Mining Co.	Rosiclare, Ill.	14′ Cone	35	⅞ x ¼	2/44	2.62-3.10
Alcoa Mining Co.	Rosiclare, Ill.	10′ Cone	15	2 x 10M	10/46	2.60
Inland Steel Co.	Marion, Ky.	5′ Mobil-Mill	17	2 x 6M	8/47	...
Kentucky Fluorspar Co.	Marion, Ky.	5′ Mobil-Mill	17	.....	10/47	...
Crystal Fluorspar Co.	Elizabethtown, Ill.	7′ Mobil-Mill	25	1½ x 10M	8/49	...
LEAD ORE						
Linton Mines	Bonita, Mont.	7′ Mobil-Mill	35	3 x 6M	6/49	3.15
TIN ORES						
Compania de Minas de Colquiri	Colquiri, Bolivia	6′ Cone	40	1½ x 4mm	11/41	2.65
Cia Minera Unificada del Cerro Ricode Potosi	Potosi, Bolivia	9′ Cone	36	1 x 6M	4/48	2.60
Patino Mines & Enterprises, Inc.	Catavia, Bolivia	1-10′ Cone	125	1⅛ x 5/16	4/49	2.64
		1-10′ Cone		5/16 x 1mm		
CHROMITE ORE						
Benguet Consolidated Mining Co. (Masinlac Chrome Mines)	Philippine Islands	Sweco	40	4 x 4M	5/50	?
ANDALUSITE						
Vereeniging Brick & Tile Co., Ltd.	Vereeniging, S. A.	5′ Cone	8	.....	7/49	...
MAGNESITE						
Northwest Magnesite Co.	Chewelah, Wash.	20′ Cone	145	1¼ x ⅛	10/43	2.98
Canadian Refractories, Ltd.	Kilmar, Quebec	14′ Cone	40	1½ x ⅛	4/49	2.7
GARNET						
Barton Mines Corp.	North Creek, N. Y.	54″ Akins	25	1¼ x ⅛	9/41	3.38
DIAMONDS						
Premier (Transvaal) Diamond Mines, Ltd.	Cullinan, S. A.	4-16′ Cones	500	1 x 10M	2/50	2.80
Anglo-American Corp. of S. A.	Kimberly, S. A.	5′ Cone	15	.....	11/49	...
GRAVEL						
Royal Canadian Air Force	Rivers, Manitoba	7′ Mobil-Mill	75	1½ x 10M	9/48	2.4



Prefabricated units go to the far corners of the earth

coarser fraction then reduced in size and returned to the original feed to the Akins separator. In this way it was possible to increase the over-all efficiency of the plant and made possible treating ore that could not be handled with the original cone.

Here again the challenge of developing this scheme has been taken up and Western Machinery Co., in presenting a drum separator, has decided that it can advance this way of concentration by using two drums operating in tandem. The first drum operates at one gravity with the sink from this drum being placed in a secondary drum at higher gravity, thereby producing a float from the primary drum and a middling and concentrate product from the secondary drum. This scheme can likewise be carried on in several other mechanical type separators. It is just a question of degree of magnetics that must be developed in order to suffice the problem. So far, the Mesabi Range has not seen the necessity of producing a positive middling product. The future, however, may change this to the degree that three-way separation proves helpful in furthering the advance of the ore dressing problems. The three-way separation again shows the thought that is being put into the Heavy-Media process to make it attractive to operators who have difficulty in obtaining efficient separations in the coarser sizes.

Heavy Media Has Wide Application

The art of Heavy-Media separation has come far from the initial effort of separating zinc-lead ores and manganiferous ores. Basically, the flowsheet has not changed in that it still requires a Heavy-Media separator followed by adequate screening and recovery equipment for maintaining a low degree of media loss as well as retaining a fluid media for efficient separations.

Referring to the list of operations employing the Heavy-Media process, the variation of minerals and materials involved show the effectiveness of this scheme. It has long been realized that the process is elastic and will satisfy virtually all ratios of concentration. This is clearly indicated by the range of the process from separation of diamonds from gangue through the more moderate recoveries obtained in zinc-lead operations and the heavy recoveries made on iron ores.

Cost Factors

A general question presented by those considering the Heavy-Media process is the cost per ton. This takes in many variables and no answer will satisfy all conditions. Papers presented that incorporate in cost figures are specific as they apply to an immediate problem but cannot be applied generally.

Factors to be taken under consideration in evaluating the problem include geographic location, type of media to be used, amenability to the Heavy-Media process, ratio of concentration, general economics and whether or not the process is to be used for final concentration or as a scalping process for primary elimination of tailing material. In order to obtain an idea

TABLE II—HMS PLANTS UNDER CONSTRUCTION

Name	Plant Location	Vessel	Feed Rate Tons/Hr.	Size Range	Starting Date	Specific Gravity
BITUMINOUS COAL						
Pocahontas Corp.	Itman, W. Va.	3 Link-Belt	250	6 x 3/8	10/50	1.60
Pickands Mather & Co.	Mather, Pa.	Link-Belt	280	3 x 1/4	1950	1.40
Powell Coal Co.	Kittanning, Pa.	7′ Mobil-Mill	65	4 x 8M	7/50	?
Hallidayboro Coal Co.	Elkville, Ill.	7′ Mobil-Mill	50	4 x 3/8	7/50	?
Lone Star Coal Co.	Brazil, Ind.	7′ Mobil-Mill	30	4 x 1/8	1950	?
Hensies	Belgium	Wemco	200	80mm x 6mm	1951	...
		Wemco	100	6mm x 1mm		
W. O. Gulbranson, Inc.	Houtzdale, Pa.	10′ Cone	100	2 1/2 x 1/4	7/50	...
Crystal Block Coal & Coke Co.	Rawl, W. Va.	Sweco	50	.....	1950	...
IRON ORE						
Inter-State Iron (Hill Annex Mines)	Calumet, Minn.	(WKE)	400	.....	7/50	...
Cleveland-Cliffs Iron Co. (Canisteo)	Minn.	Hardinge	250	1 1/2 x 1/2	7/50	...
Georgia-Alabama Ore Co.	Bluffton, Ala.	7′ Mobil-Mill	40	3 x 1/4	9/50	...
DIAMONDS						
Williamson Diamonds, Ltd.	Tanganika	7′ Cone	60	.....	1950	...
Consolidated Diamond Mines	Southwest Africa	12′ Cone	80	.....	1950	...
Forminiere (Soc. Internationale) Forestiere et Miniere du Congo	Belgian Congo	7′ Mobil-Mill	50	.....	1950	...
LEAD—ZINC						
Mesloula	Algeria, N. Africa	7′ Mobil-Mill	40	.....	1950	...
LEAD ORE						
Zellidja	French Morocco	18′ Cone	50	.....	1950	...
MAGNESITE						
General Refractories Co. (Austrian-American Magnesite Co.)	Radenthein, Austria	14′ Cone (Wemco)	60	1 x 10M	1950	...
FLUORSPAR						
Newfoundland Fluorspar, Ltd.	St. Lawrence, Nfld.	7′ Mobil-Mill	15	1 x 10M	1950	...

as to how one would proceed to obtain the desired information, a hypothetical case might be considered that would include all the steps necessary for proper examination of the problem. A study of the situation might, for example, involve a property that has either approached extreme ratios of concentrations, thereby involving high crushing and grinding costs, or properties where gravity separation such as jigging will no longer satisfy the present needs of beneficiation. In either case, an adjustment has to be made if the property is to continue operation. Fortunately, in both cases there are usually enough exposures available from which representative samples may be taken.

To obtain a fair and unbiased answer, it is understood that representative samples have to be taken. These would be subjected to a series of tests, such as have been developed by experience, that will predict whether or not Heavy-Media will suitably afford the desired separation. A study of these preliminary results will determine whether or not additional work is justified.

One might ask how such tests can be run, particularly when such procedures are not described or made known in present-day ore dressing manuals. The procedure itself is relatively simple and adequate directions can be obtained from those who are presently practicing the Heavy-Media process. Study and investigation to obtain the separating characteristics will determine the amenability of the process to the samples in question. Pilot plant test work is usually conducted on relatively large samples and is generally conclusive enough to establish whether or not commercial application should be considered.

When preliminary work has determined the possibility of applying this process, it is often possible to run pilot plant tests in the mill to establish continuous operation on a small scale. This type of experimentation is beneficial. It balances out the potential metallurgy and establishes the mechanics involved, thereby greatly assisting in the ultimate plant design. The machinery manufacturers have been of great assistance in recent years in offering technical as well as mechanical assistance in making installations.

Once cost figures have been accumulated and studied, then the operator can determine whether the application of the Heavy-Media process will reduce operating costs. In most cases it has definitely been proven that once Heavy-Media has been applied to the problem, materials heretofore considered non-concentratable can be treated at a profit. This has been proven time and again as properties that have been idle for years are again operated once Heavy-Media became a part of the flowsheet.

Favorable Criteria

Factors that contribute to the success of Heavy-Media are: (1) Concentration of ores in which the gravity separation of the ore and gangue is too close for hydraulic means; (2) Heavy-Media separation produces higher recoveries due to closer selectivity based on apparent specific gravity; (3) The Heavy-Media process makes it possible to handle larger tonnages; and (4) Rapidity of separation by the Heavy-Media process means more tons of concentrates per man-hour worked.

In the final analysis, the operator will have to balance off the costs of labor, power and material. If the tonnage is not increased by adopting the Heavy-Media process, then the only possible gain can be that of additional recovery due to the high degree of selectivity. In this case, it is doubtful whether or not the process would pay its way. In virtually all instances, however, not only the recovery but also the feed rate is increased which means more tons of feed as well as concentrates per man-hour worked.

Two wars have taken a devastating toll in depleting domestic ore reserves. Heavy-Media has made it possible to mine material heretofore considered uneconomical. Apparently, we are faced with a third war which will demand heavy tonnages from our mining industry. It doesn't take much imagination to realize the problems that will face the mining industry should this war come. It has been said that a third war would never be fought from the reserves of the Mesabi Range. This statement will be proven wrong, as the Heavy-Media process demonstrates its real worth in fulfilling requirements for the immediate future if another war is fought from the existing reserves.

Acknowledgment is hereby made to the American Cyanamid Co., Link-Belt Co., Western Machinery Co., The Nelson L. Davis Co., Colorado Iron Works Co., and the Hardinge Co., Inc., for the information and data submitted for study in making this paper possible.

Quicksilver

(*Continued from page* 87)

aggregate in the manufacture of concrete blocks. This is known to be going on at one California mine, the Sulphur Bank, in Lake County. At this property a dump of screen undersize (reject from the ore, which is a leached basalt) furnishes the bulk of the aggregate. Coloring matter is provided by small additions from the calcine dump.

(5) A fairly common means of keeping body and soul together is the sale of timber growing on the mining property. This can range all the way from the logging and hauling of small diameter growth for poles to the cutting of large saw logs (which are sometimes milled on the property).

The photograph shows a typical millpond near the town of Sutherlin, Ore. This community is tributary to the timbered areas of the Bonanza and lesser quicksilver properties of Douglas County, Ore.

(6) Some mines with good camp buildings have sold or rented them for use as dwellings. The photograph shows the camp of the Hermes mine near Stibnite, Idaho. Its family cabins were leased for a period to the neighboring Yellow Pine antimony mine, to accommodate the latter's overflow personnel.

There is at least one instance of a mine dwelling being used as a hunting lodge.

(7) The most obvious course is the selling off of machinery and equipment. This has proved profitable during much of the post-World War II period, and has been pursued to such an extent that some properties are literally stripped—but not for action.

The photograph shows the ex-Opalite kiln doing double duty as a dryer at the Yellow Pine mine. This one-time 4-ft by 60-ft cinnabar roaster of southeastern Oregon has been bisected, and its halves now dehydrate antimony and gold concentrates in south central Idaho.

Any mine that has been in operation for a number of years has accumulated a substantial quantity of discarded equipment and other junk. The quicksilver mines are no exception to this, and have been selling truckload after truckload of scrap iron, steel, copper and other scrap metals.

By these and other means, our quicksilver mines have eked out an interim existence. But now the sun of a new day seems dawning. With a spot New York price of $218-221 per flask in late March 1951 and with even higher quotations rumored, it seems certain that father can come home from the poorhouse. The price is wholly due to Spanish action and has no guaranteed stability; but is so high that 1951 is bound to see something stirring on the domestic quicksilver front.

* * *

Editor's Note:

In spite of a rise in consumption of mercury during 1950 (49,600 flasks compared to 39,857 flasks in 1949) output of domestic mines totalled only 4440 flasks, less than half the 9930 flasks produced during the previous year, and the lowest in the 100 years covered by production records.

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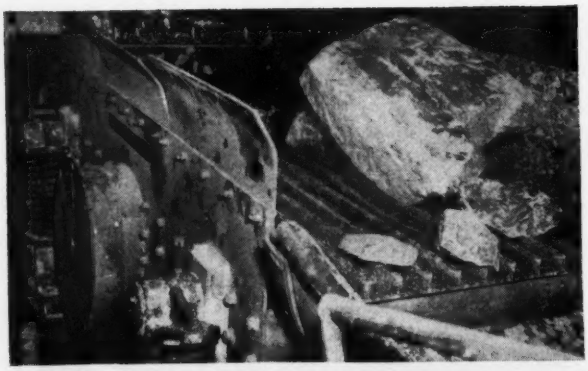

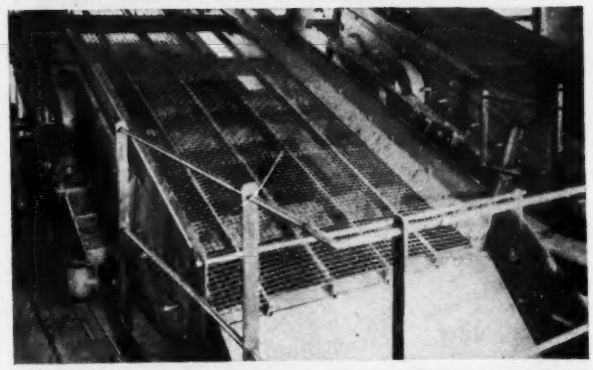

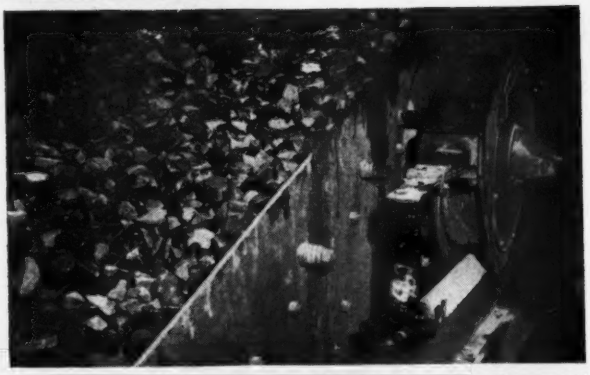

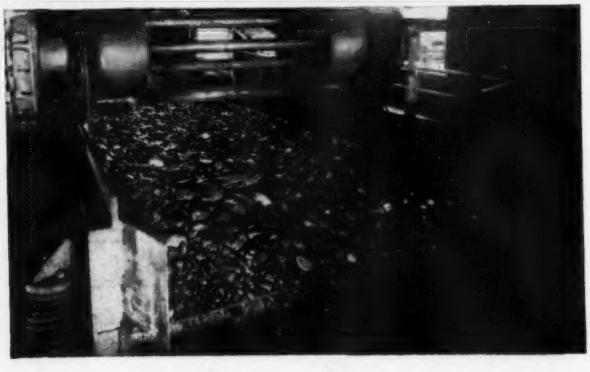

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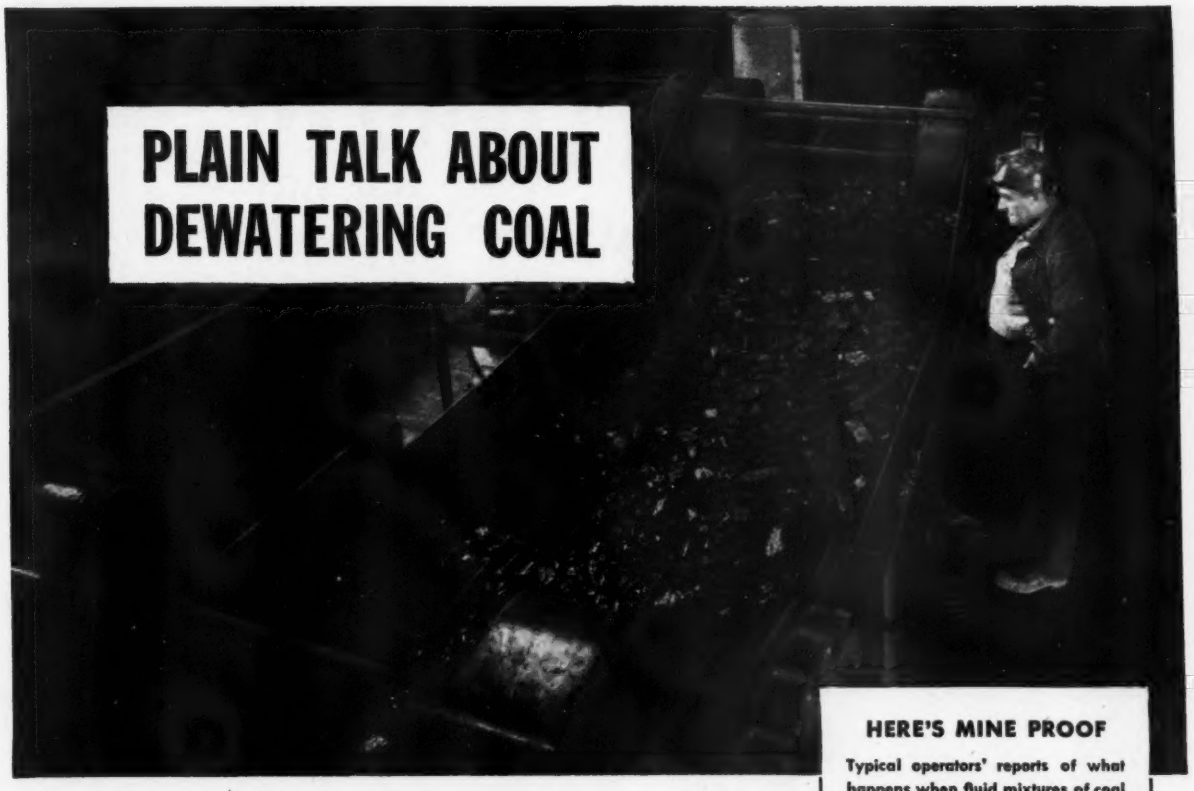

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Let's face it. You have to wash your coal; good practice necessitates it. Before shipment, you have to dry that coal; customers and some state laws demand it.

So it boils down to this: how are you going to dry it . . . how much must you spend for equipment . . . how effective is that equipment?

Among available dewatering methods, one machine is far ahead of all others in the two factors most important to you: it costs as little as one-seventh of centrifugal-types; its demonstrated effectiveness is far greater than competing makes. This machine is the Hewitt-Robins Eliptex® Dewaterizer with patent-protected* deck.

The crucial test is in the smaller sizes. The Eliptex Dewaterizer discharges ⅛" x 0" bituminous with as little as 9% surface moisture; #4, #5 and even Ultra-Fine anthracite is reported "completely free of surface moisture" at the discharge end. Other typical verified field reports are shown in the box.

The design, operation, decking and performance of the Hewitt-Robins Eliptex Dewaterizer cannot be secured in any other machine.

Since business policy demands that you dry your coal, and economic conditions dictate every possible reduction in capital investment, it is just good common sense to investigate the Eliptex Dewaterizer and its field-proved effectiveness. Bulletin No. 129-A gives operating facts and performance figures. Your copy can be secured by writing Robins Conveyors Division, Passaic, New Jersey.

HERE'S MINE PROOF

Typical operators' reports of what happens when fluid mixtures of coal and water (often 2½ times water to coal, by weight) are fed to the Eliptex Dewaterizer:

SIZE	KIND	SURFACE MOISTURE LEFT
½ mm	W. Va. Bit.	16%
⅛" x 0"	Ky. Bit.	9%
7/16" x 0"	Ohio Bit.	8%
¾" x ⅛"	W. Va. Bit.	6½%
1½" x ⅛"	W. Va. Bit.	4½%-6%
¾" x 1/16"	Nova Scotia Bit.	4½%

HEWITT-ROBINS
ELIPTEX DEWATERIZER

*U. S. Patents 2,200,724 and 2,457,018

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● McCarthy Self-Propelled Horizontal Blast Hole Drills get in and out of tight quarters quickly; adjusts on four individual leveling jacks for proper drilling heights. Excellent for low level work.

● Truck Mounted Horizontal McCarthy Drills are breaking drilling records everywhere! All necessary equipment is carried with the unit — out of the mud at working level!

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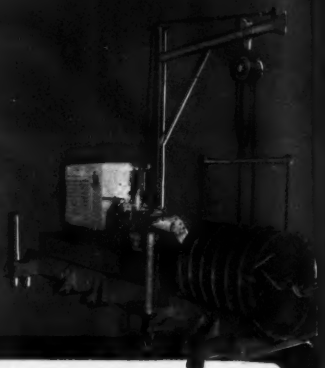

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Extra heavy construction relieves you of maintenance troubles. They're versatile, fast, economical machines capable of 50% more productive service than any drill you might now be using!

Write Salem Tool today for full facts. Also ask about McCarthy Coal Recovery Drills — the machine that's being acclaimed in so many trade journals for its remarkable ability to reduce mining costs.

DRILLING EQUIPMENT SINCE 1901

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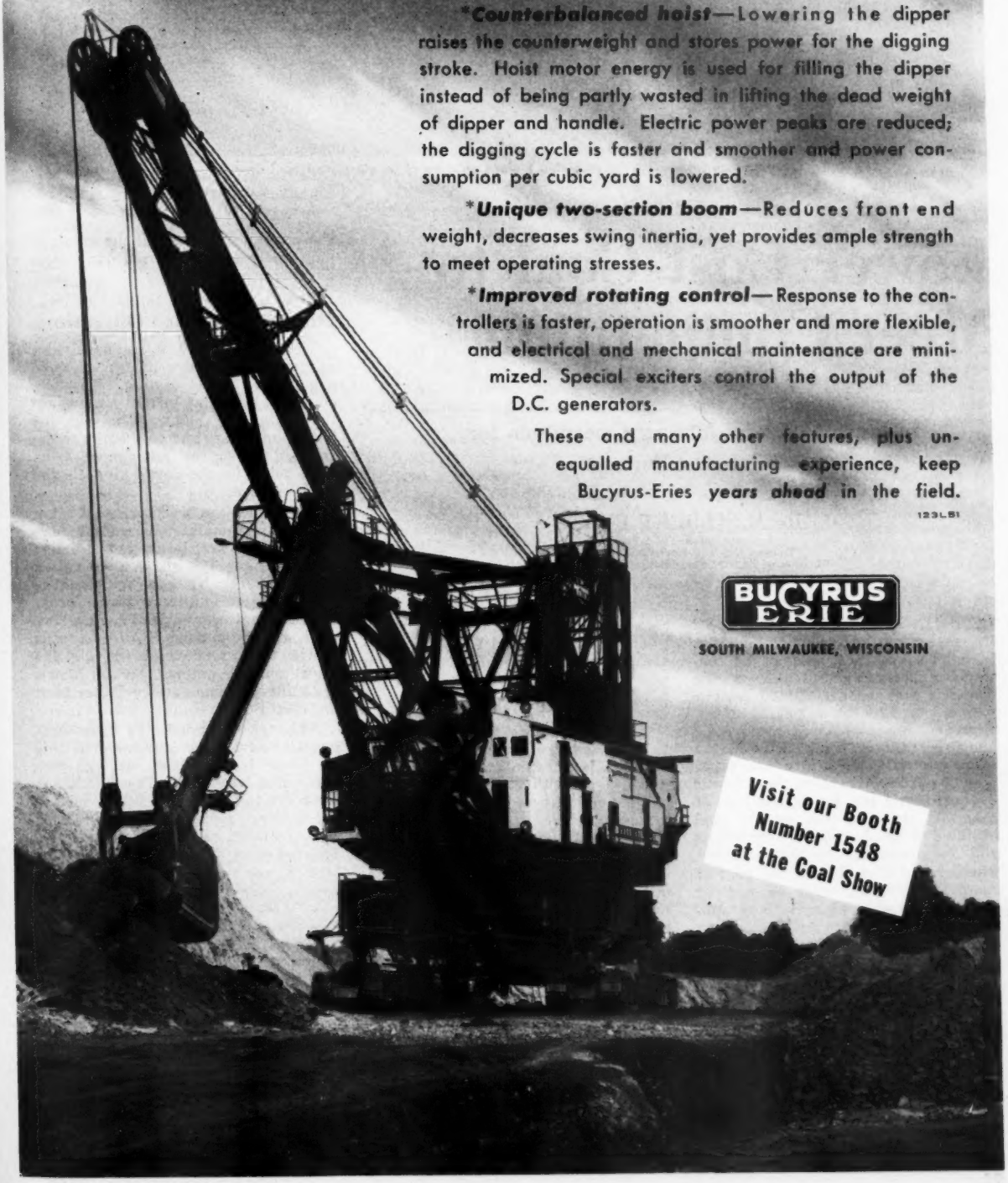

Only Bucyrus-Erie stripping shovels offer these advantages:

***Counterbalanced hoist**—Lowering the dipper raises the counterweight and stores power for the digging stroke. Hoist motor energy is used for filling the dipper instead of being partly wasted in lifting the dead weight of dipper and handle. Electric power peaks are reduced; the digging cycle is faster and smoother and power consumption per cubic yard is lowered.

***Unique two-section boom**—Reduces front end weight, decreases swing inertia, yet provides ample strength to meet operating stresses.

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Continuous face conveyor is a step toward solution of uninterrupted coal flow

Lower Cost Coal to Meet Competition

Improve Direct Mining Operations for Greatest Returns

By M. ALBERT EVANS
Assistant to the Vice-President,
Eastern Gas and Fuel Associates, and
Member of BCR Mining Development Committee

BITUMINOUS COAL has been faced by serious competition from other fuels: Natural gas, because of convenience, has displaced part of the domestic coal market; Diesel electric locomotives, because of operating advantages, have displaced more coal; and Fuel Oil is being delivered in large quantities to utility and other plants; particularly along the Atlantic Seaboard, at a cost lower than that of coal. If these inroads on the coal business cannot be stopped, the effects will be disastrous to the industry. These remarks deal with the part of competition which must be met by lower cost coal. To make any substantial reductions in costs, we must take an entirely new approach to the problem: We must turn to research.

Since 1619, when a man named Dud Dudley, pressed by the mounting cost and scarcity of charcoal, invented a process for smelting iron with coal, to the present time, when DuPont, by technological improvements through research on manufacturing methods, was able to reduce the cost of cellophane from an initial $2.65 per lb to the present $.50, the pressure of high cost has been a primary factor in the development of new inventions and new methods.

It is a pleasant characteristic of this pursuit that the by-products of research are often immensely valuable in themselves. For instance, while doing basic research on the isolation of rubber molecules, Bell Telephone workers developed a method by which cable could be continuously vulcanized at the rate of over a mile a minute, thus reducing tremendously the cost over that of the previous intermittent batch method. We already have been the beneficiaries of an interesting by-product developed during research by the Mining Development Committee, a stainless steel belt shaking conveyor now being tested. We can expect more.

Assuming, therefore, that it is necessary to find ways and means to reduce operating costs and that other industries have successfully done so through research, the next step is to determine from which part of the mining operation we can expect to get the greatest, and quickest, return from our efforts and investment.

Direct vs. Service Operations

The operation of any mine divides naturally into two parts: Service groups and Direct Mining. The first starts at the point in the mine where the main line motor picks up the loaded mine cars and goes outby to the railroad cars; the other goes from that point in the mine inby to the working face.

Service Mining is comprised of main line haulage, maintenance of haulage roads, power, ventilation and drainage facilities, supplying face operation materials, repairs and maintenance outby the area of Direct Mining, preparation plant, clerical and engineering work and supervision. All of this is routine work, following practically the same general pattern at all mines, regardless of seam, roof or other mining conditions.

Although one mine may have some physical advantage over another, this at times is cancelled out by some other disadvantage. The handicaps often can be balanced so far as operating costs are concerned by the application of known engineering principles. This probably would mean an expenditure of money, the advisability of which would be determined by an analysis of the economics of the problem. For example, a long main line haul might be made a low cost haul by use of larger and higher speed equipment; or a mine with excessive water might be able to reduce or almost eliminate pumpers by installation of deep well turbine or other types of automatic pumps, or by ditches, or by a combination of these.

Another point to be considered is that any one of the Service Groups usually involves comparatively few men, so that correcting a physical dis-

Based on an address at Annual Meeting of Bituminous Coal Research, Inc., March 7, 1951, Columbus, Ohio.

advantage affecting so small a group would seldom make a substantial cost reduction.

A survey, made in 1949, of a number of mines in West Virginia, Pennsylvania, Ohio, Kentucky and Illinois, producing better than 9,000,000 tons per month, showed an average tons per manshift for service labor of 18.0 in the mines of the group having 100 percent mobile loading, 17.9 for mines having 100 percent hand loading, and 16.4 for mines having combined hand and mechanical loading, or an average of 17.6 tons. We know that in most instances we can, as before stated, by applying known engineering principles, increase this tonnage to 20 tons per man in those mines having a balanced retreat and development production without too much trouble.

A number of mines have a better service labor performance than 20 tons per man and a figure of somewhere nearer 30 might be called theoretically perfect or par for this phase of the operation, except for very unusual conditions.

Direct Mining, which starts where the main line ends and goes inby to the face, including both development and retreat work, is comprised of timbering, cutting, drilling, shooting, loading, transportation, maintenance and supervision. This phase of mining, in contrast to the uniform procedure common to most mines in Service Groups, may vary from field to field, from mine to mine within a field, from section to section within a mine and even from day to day within the section, because it is influenced by thickness of the seam, hardness of coal, bands of impurities, sulphur balls, roof and bottom conditions, overlying strata, grades, water, clayveins, gas and many other things.

The average production from published statistics for 1948 for Bituminous Underground Mines in the United States, adjusted to include mine office workers, was approximately 5.2 tons per man. This varied from a high of 8.6 tons per man in North Dakota and 7.6 in Illinois, to a low of 1.9 tons per man in Kansas. In Ohio, the average was 5.8 tons per man; West Virginia 5.5; Kentucky 5.2; and Pennsylvania 4.8.

Using the above average of 17.6 tons per man per day for Service labor and the 1948 figures for total production per man per day, then by calculations we get the following Direct Mining production per manshift:

For the United States....	7.4 tons
For Illinois	13.5 tons
For West Virginia	7.9 tons
For Pennsylvania	6.7 tons

Using this information and assuming an average daily wage of $17.60, we can make some interesting comparisions:

TONS PER MAN			
Service Labor	Direct Labor	Total Labor	Cost Per Ton
17.6	7.4	5.2	$3.38
20.0	7.4	5.4	3.26
25.0	7.4	5.7	3.09
17.6	10.0	6.4	2.75
17.6	15.0	8.1	2.18
17.6	20.0	9.3	1.89
17.6	30.0	11.1	1.59
20.0	20.0	10.0	1.76

An improvement in Service Mining from 17.6 to 20.0 tons per man day, or 2.4 tons, reduces operating costs $.12 per ton. On the other hand, an improvement in Direct Mining of 2.6 tons from 7.4 to 10.0 tons per man day reduced operating costs $.63 per ton.

Also, an increase in Direct Mining from 10.0 to 15.0 tons per man day will further reduce operating costs $.57 per ton, or a total of $1.20 per ton. But the next five-ton improvement, from 15.0 to 20.0 tons per man day, in Direct Mining, would mean a reduction of only $.29 per ton; and another 10-ton approach to perfection from 20.0 to 30.0 tons would reduce costs only $.30.

Concentrate on Direct Mining

Therefore, it is quite evident that cost reduction efforts should be concentrated in the field of Direct Mining; also, that much greater returns will come from Direct Mining improvements in the lower performance brackets.

Of the operations making up Direct Mining, timbering, or roof support, and transportation are musts and no doubt can be improved through research, but the savings will be small except in conditions where they are bottlenecks to the smooth operation of the loading cycle. Therefore, by the process of elimination, we find the four face-operations — cutting, drilling, shooting and loading—to be the phase of Bituminous coal mining to which we should direct our first cost reduction efforts.

It is for this reason that the Mining Development Committee's initial work has been directed toward the development of a machine which would do in one continuous operation all four now making up the face loading cycle—a continuous mining machine. In addition to removing coal from the face continuously, the objective has been a machine which (1) would do this under mining systems common to the industry in our country, (2) would not create new cleaning or marketing problems, (3) would have ruggedness and simplicity in mechanical design, and (4) would have flexibility to operate under varying seam conditions. Characteristics which would eliminate mechanical breakdowns and permit operation under many seam conditions are more important than large capacity. Naturally, large capacity is desired, but the fact that we can at some mines produce with conventional equipment enormous tonnages per face man on a few sections having ideal operating conditions, while the mine average for these mines is seldom but a fraction of the outstanding performance, shows that production speed is not the answer, in itself.

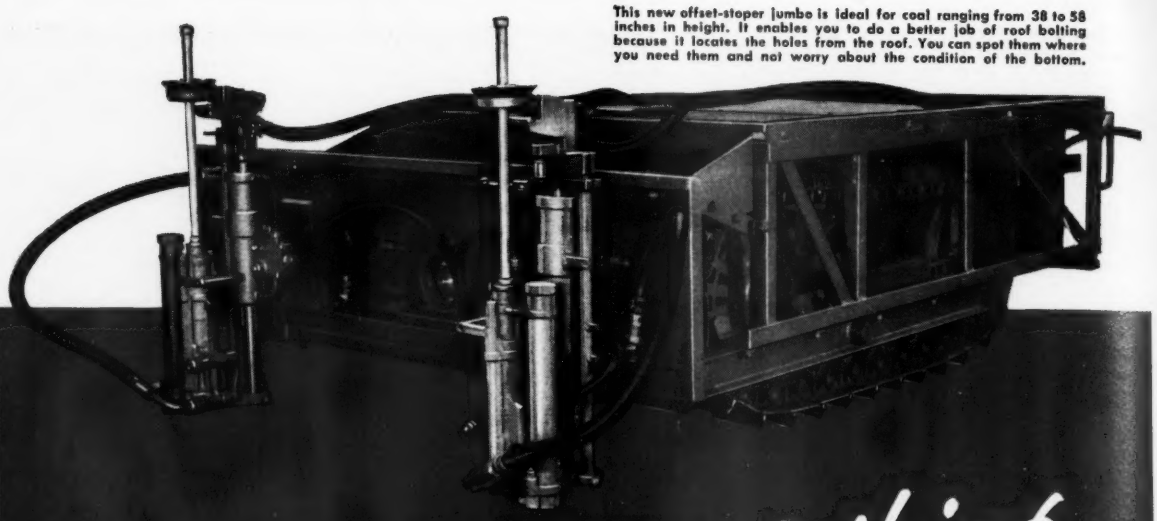
Stainless steel belt shaking conveyor, by-product of research

A Challenge to Research

This is a big order, but not an impossible task. We believe it is a problem which cannot be solved by application of known engineering principles, but rather is a question for research. When we consider that an improvement in the average Direct Mining performance from 7.4 to 10.0 tons per man means $.63 per ton or, based on 1948 underground production, $288,000,000 per year to the industry, a real incentive is given to the challenge.

Test Unit No. 2 is about ready to be placed in a mine for trial. In designing this machine much time was consumed in working out mechanical problems connected with obtaining

(*Continued on page* 117)



This new offset-stoper jumbo is ideal for coal ranging from 38 to 58 inches in height. It enables you to do a better job of roof bolting because it locates the holes from the roof. You can spot them where you need them and not worry about the condition of the bottom.

Here's the latest thing in Roof Bolting

A New Offset-Stoper Jumbo by Le Roi-CLEVELAND

Check these features and you see why this revolutionary jumbo makes roof-bolting faster, easier, more thorough.

NOW you can do your roof-bolting jobs faster and better than ever. The new Le Roi-CLEVELAND offset-stoper jumbo does all the hard work — carries the stopers, the drill steel, in fact all the material needed for a full shift of roof bolting. Your miners are less tired — get more done. Here's why:

Mobility

The jumbo is mounted on an electrically driven (permissible) crawler tractor. It gives you three forward speeds up to 3 mph and one reverse speed (1 mph). Mercury clutch for smooth operation. Brakes for turning. Side driver-seat with full controls for travel in either direction.

Faster drilling and bolting

Jumbo carries 2 Le Roi-CLEVELAND S-11S offset-stopers, each with 12-inch steel change. The feed-legs of these stopers do two jobs — raise the machines to drilling position and position the dust collectors at the drilling face. All controls are conveniently located so that you can drill holes, drive bolts, and set nuts with one set-up.

Positive dust control

On this new unit, there's a separate dust collector for each stoper drill. The fines are deposited as follows: 95% in a primary tank and 5% in a filtered secondary tank having a filter area of 60 sq. ft. for each stoper.

Add all these things up and you have the latest thing in roof bolting. Try this new unit in your property. Watch your costs drop, production rise. Write for complete details.

See the new Stoper Jumbo at the 1951 Coal Show of the American Mining Congress, Booth No. 1021, Cleveland Public Auditorium, May 14-17

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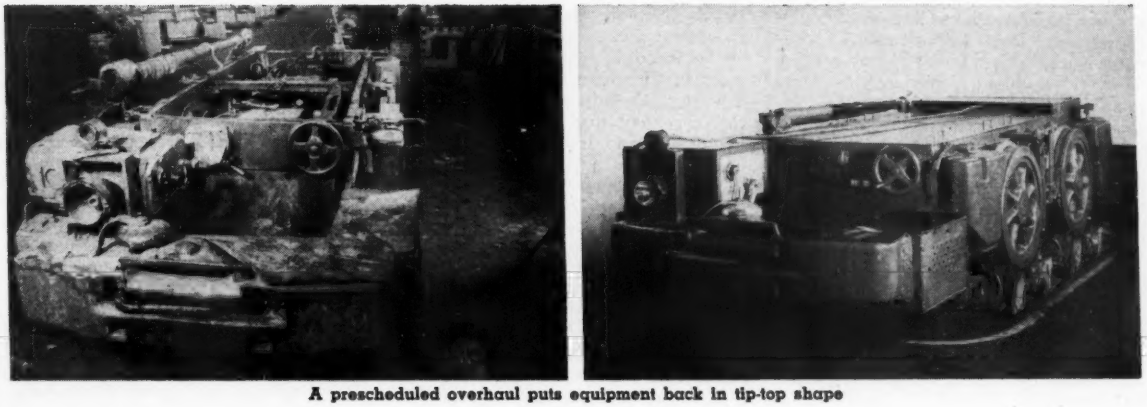


A prescheduled overhaul puts equipment back in tip-top shape

Planned Maintenance

Systematic Equipment Care Cuts Mining Costs

By W. E. WOLFE
Plant Superintendent
National Electric Coil Co.

THE coal industry, as a part of its recent modernization program has made remarkable strides in mine safety. First Aid Training to reduce the effect of injuries led to the promotion of safe practices to reduce their number and today no accident record is closed marked "unavoidable." The industry has accepted the fact that accidents don't happen—they are caused. Much the same attitude is developing toward machine failures. The growth of mechanization has brought a real challenge to the industry—machines must be kept in operation and success or failure in their maintenance will be the measure of success or failure of their operation.

Mechanization has removed much hard manual labor from coal mining—as from all major industries including farming—but the elements from which machines are fashioned, are subject to fatigue and strain much as men are. We dare not abuse, overwork or fail to sustain them. Suppose, in order to visualize the maintenance problem, that we compare a machine to the physical structure of a man. In such a comparision the operator is the "brain"; the control is the "nervous system"; the wiring makes up the "arteries and veins"; the power is the "life blood"; the frame is the "skeleton"; and the working parts are "vital organs." From this viewpoint can clearly be seen the effect of overstrain and especially can the importance of keeping all these functions in good working order be realized; a failure of any one will certainly affect over-all machine performance and perhaps stop it completely.

It is a theory of electrical and mechanical science that a machine will run indefinitely and do its work day in and day out if properly designed for the job and properly cared for. But in actual practice there is one factor to keep in mind to approach this theoretical goal. Whether a machine breathes or operates mechanically it is only a matter of time until it reaches the end of its useful life and the amount that this time is extended or reduced beyond the original expectancy is relative to the amount of work the machine has done under or over its rated design capacity and relative to the degree of care that it has been given.

Maintenance Subdivided

There are at present three general types of maintenance: ordinary, preventive and planned.

Ordinary maintenance, which regretably represents too large a portion of present day practices, is the type where repairs are made only after a breakdown occurs. Such repairs are made in any manner, with anything found or borrowed and in the quickest time possible. Then, until the next breakdown, nothing is done except to hope that luck will hold out. Let's write this type off.

Preventive maintenance saves many interruptions in the smooth flow of

Carefully scheduled inspections uncover danger points

production by the use of routine inspections, observing operating loads and conditions, making minor repairs and adjustments, checking overload relays and other protective devices, reporting defects to be repaired off-shift, schooling operators in proper handling of equipment and lubrication. Preventive maintenance should be an adjunct to a planned maintenance program.

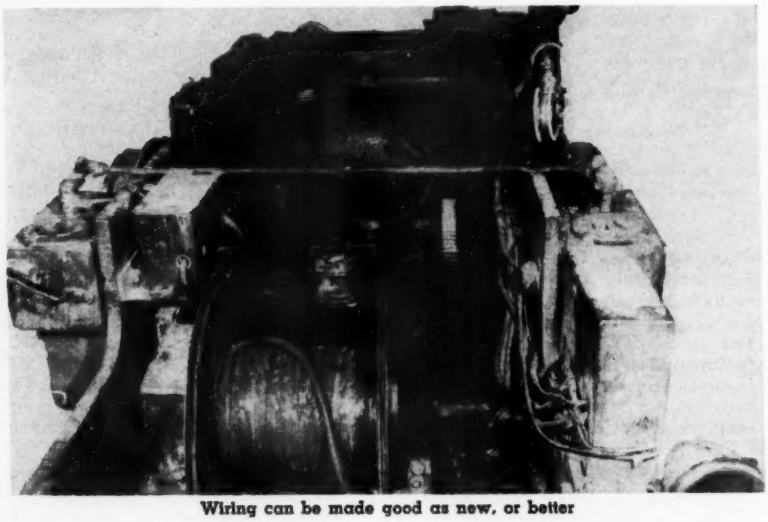
Planned maintenance works on the theory that every machine and motor is eventually destined for a complete overhaul and embodies this factor in the original design of the equipment and lay-out for the operation. Then the following points are given special attention:

(1) Decide how and where the work will be done, if and when necessary.
(2) Determine what units are absolutely essential to the continuous flow of production.
(3) Estimate whether or not the cost of delay would exceed the cost of a spare or a component part which could not be readily replaced.
(4) Make advance schedules for inspection, repairs and overhaul for each machine in line with its relative importance to production and relative to the probable life of its various components.
(5) Keep available special skills in personnel for the various types of work.
(6) Keep a running record on each individual unit showing performance, outage time, repairs, costs and other statistical data essential to factual analysis of the plan.
(7) Plan the work and work the plan!

Planned maintenance is gradually gaining prominence as the solution to the over-all maintenance problem. It is through this method that the manufacturer can best serve industry. The cost of maintenance is primarily the responsibility of the owner of equipment and in the past the manufacturer was not too concerned with the maintenance problem. Rather, he proceeded on the theory that the customer was always right and designed and built the machine to his customer's specifications. We now know that any machine, no matter how liberally designed and rigidly constructed, is eventually destined to failure; therefore, future maintenance becomes a prime factor for consideration and is a prerequisite to design. Herein lies the first major decision to be made if the manufacturer's aid is to be fully utilized in future maintenance.

Packaged Units the Solution

Two courses are open to the operator. First, he can build his own shop, fully equip it with proper facilities and man it with skilled personnel to do high-class maintenance work. Or, second, he can solve the maintenance problem by eliminating it. This is being done by designing the component parts of the machine into package units accessible to replacement with only semi-skilled mechanics or assembly men needed at the mine operation. When not engaged on replacement, their time can be utilized on the preventive maintenance program previously outlined if they are trained as maintenance inspectors.



Wiring can be made good as new, or better

Under the package plan a tremendous capital investment and overhead in skilled personnel is written off. The problem of maintenance reverts to the manufacturer where it rightfully belongs. Unless he shoulders his load, he will soon have competition from specialists and the most economical solution will result in the American way through competitive enterprise. Sealed units is the modern trend—yet the domestic refrigerator is an outstanding example. The life of the automobile has been extended to a greater degree than dreamed possible through the science of planned maintenance. The Diesel locomotive is of package design and serviced in such units.

Obviously, without package design the manufacturer must sacrifice structural rigidity and most sealing from the elements in order to facilitate repairs in the field which eventually becomes neccessary. If he is allowed to design for long life, notwithstanding any disheartening failures that may occur in the process of development, trouble-free equipment will be in the offing. As industry becomes more fully mechanized, the problem of maintenance becomes more complex. In the past the owner has shouldered more than his fair share of the maintenance burden by reason of the fact that he has been forced to maintain equipment improperly designed to do the job for which it was purchased. By the same token the manufacturer has taken considerable loss because the owner changed his mind and used equipment to get more production than that for which it was originally designed.

Planned maintenance resolves itself into a program of "plan your work and work your plan" insofar as actual operation is concerned. Any deviation brought about by a requirement for greater production or a change in conditions calls for a re-study of all the factors involved in cooperation with both manufacturer and owner. This being true, does it not suggest that there is plenty of service left in present equipment that can be made available by instituting a rehabilitation program through cooperative consultation with the manufacturer who has the facilities, experience and know-how to furnish the necessary materials for change-over. Many such programs have paid their own way through reduced maintenance costs. True, the manufacturer wants to sell a new machine, but he is also happy to see a machine of his previous design faithfully doing its job and performing the task for which it was originally intended.

Control System Important

Under a planned maintenance program it is inevitable that the re-study will call for replacement of some units, which are inapplicable, inefficient and beyond economical rehabilitation. However such units may well be eliminated for they are the ones contributing most to the high cost of maintenance. The economical solution is reduced to simple mathematics, but, in the main, a control system installed along with the prescheduled overhaul of the units will show the greatest savings in maintenance costs. The

Preventive maintenance in action—locomotives lined up for routine inspection

greatest advance in modern-day equipment has been the development of controls to eliminate much of the human error, hazardous conditions and poor judgment of operator, through protective devices, sequence interlock and indicating instruments.

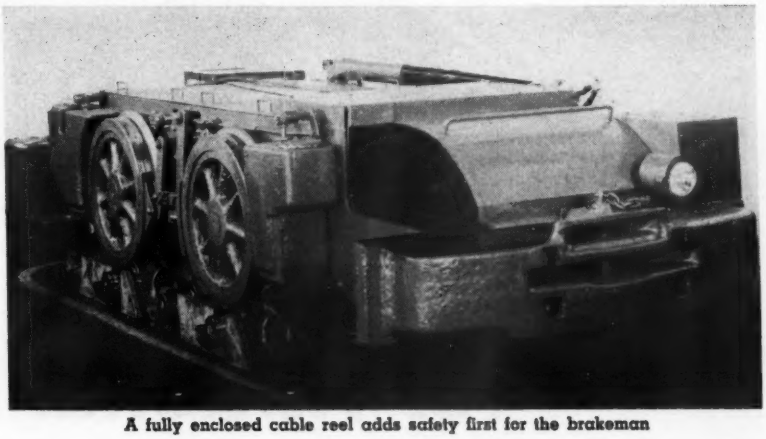
A control system however is worthless, with time, money and effort thrown away, unless a preventive maintenance program is set up and rigidly adhered to. The manufacturer builds into his motor a thermoguard which automatically opens the power circuit in case of excessive rise in temperature due to overload or other causes; or an overload relay which limits the amount of current drawn from the line. These impulses are sent to the "brain." If he disregards them and bridges out this particular nerve, an expensive rewind will surely be required with an attendant greater loss in production. On the other hand, the cause is more important than the result at the moment; the over-heating is a symptom of impending disease and if the cause is unknown, it should be reported immediately for diagnosis.

Since power normally comes under the supervision of authority other than the maintenance man, it must be closely linked with the planned maintenance program. If it is not kept within normal limits of voltage and capacity, high maintenance costs in coils, wiring and controls function are inevitable. We all know what low or high blood pressure will do to the human body. Abnormal voltage can kill a motor. A 10 percent variation from the name plate rating is a safe yardstick. Manufacturers design their equipment to tolerances in power supply for motors, but they do not expect these voltages over and above name plate rating to be used for normal function; they are the motor's safety factor.

Stick to Name-Plate Ratings

Returning to our human chart—preventive maintenance takes care of the power or "life blood." The "skeleton" of most old equipment is liberally designed and will stand the shock of time and work. The working parts or "vital organs" can be renewed or repaired by predetermined overhaul based on experience or estimated time of service. Wiring or "arteries and veins" are made good as new, or better, with modern insulation. The "nervous system" or control offers the greatest opportunity for reduced maintenance cost and trouble-free equipment. It is here that the manufacturer has something worth while to offer already developed, notwithstanding the additional advantage of standardization and modernization which can be had in the process of a rehabilitation program.

If the operator will stick strictly to the name plate specifications of the equipment and require the manufacturer to design equipment to do the job specified, a continuous flow of production and trouble-free equipment will be the eventual result.



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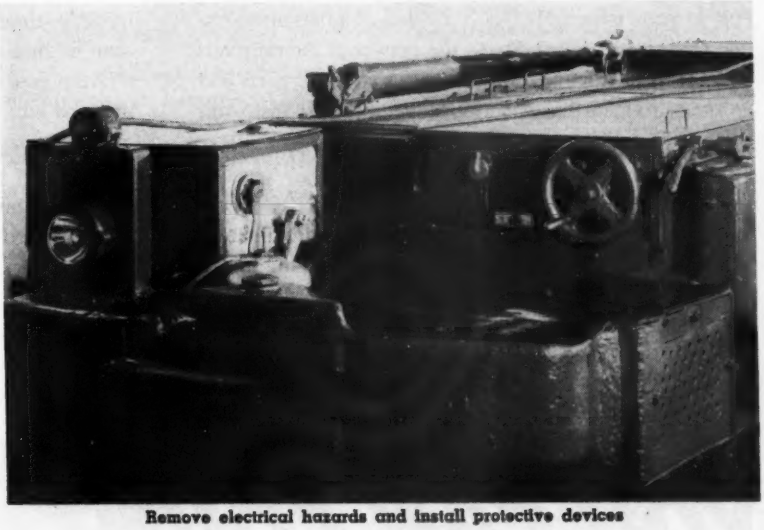

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Better coal and more efficient production have always been the aim of America's progressive mine operators. Private management has invested hundreds of millions of dollars in modern preparation plants—research—improved equipment and new mine properties. Today the country's need for coal is great. The coal industry is ready—and able—to meet that need!

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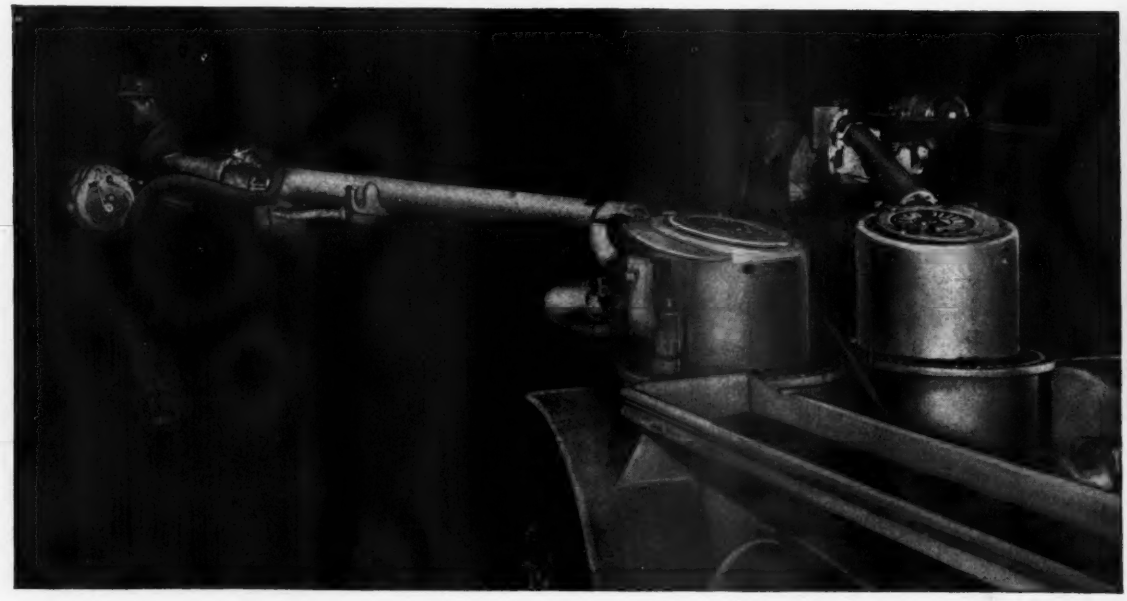
- **Electric Roof Bolting Units drill bolt holes and run nuts**
- **Permissible Post-Mounted and Hand-Held Drills—the world's largest line**



- **Air-Driven Roof Bolting Impact Wrenches run nuts and bolts to 1¼" bolt size**
- **Sump Pumps, high lift, low air consumption and large capacity; require no priming**
- **Sludge Pumps built to handle water containing up to 15% solid matter**

In an Illinois mine TDD DOUBLE ARM TRAMDRILLS are working sixteen places per shift, drilling eighteen 3½" diameter, 8-foot holes per place. Averaging 250 holes per shift, they sometimes drill over 300 holes.

In an Indiana mine, where 1⅜" diameter holes are drilled to a depth of 46", actual tests with CP ROOF BOLTING UNIT show an average, for the complete operation of drilling, inserting expansion bolts and nut running, of less than five minutes per bolt.

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PRODUCTION
Exposition

Roof Bolting Unit drills hole for suspension roof bolt

Roof Bolting Unit tightens nut on roof bolt

CP-3630-RPSH
Impact Wrench handles nuts to ¾" bolt size

CP-365-RPSH
Impact Wrench handles nuts to 1¼" bolt size

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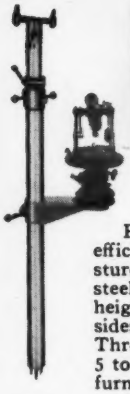

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For use in all types deep mining, especially efficient for conveyor mining. As rigid as a prop, sturdily constructed of aluminum and stainless steel. Lightweight, easily, quickly sets up correct height for transit. Main column graduated on 2 sides in 1/100 foot.
Three standard lengths telescoping from 3 to 5 ft., 5 to 8 ft., and 8 to 12 ft. in height. Special lengths furnished on request.

BOWDIL BITS

Patented concave design increases bit clearance, assures longer wear without increased power consumption. Made from special steel, rolled, with concave faces. Tests in hundreds of mines have proven these Bits last 15% to 20% longer. Bowdil makes the right size and shape bit for every mining condition, to fit all types of chain.

BOWDIL CUTTER BAR

Bowdil Cutter Bars are designed for extra strength and power saving. Rivet-free body, Z bar construction, wide wearing strips make it the sturdiest bar in mining. Bowdil Bars are standardized to fit all coal mining machines.

FABRI-FORGE CHAIN

Lower your operating costs with Bowdil Fabri-Forged Chain. Rugged, easy to maintain, the drop-forged lug body stands up under heavy wear with breakage practically eliminated. A major improvement is the true-running radial track guide.

BOWDIL FAST ROPE SOCKET

You can save time with the Bowdil Rope Socket . . . takes just two minutes to install. No tools necessary. High tensile-strength steel and patented design give maximum strength.

REPLACEABLE POINT MINER'S PICK

With a Bowdil Miner's pick, it only takes a few seconds to replace a dull, blunted point with a sharp one. Light or heavy, Bowdil pick heads are perfectly designed for weight and balance, come with or without wood handle.

ALLOY STEEL AUGERS AND DRILL BITS

Uniform temper and shape eliminate almost all possibility of "grabbing." The use of special heat-treated alloy steels not only makes them last longer, but adds an important safety factor.

BOWDIL DRILL BITS

Any bit requirements can be met from Bowdil's complete line. Fish-tail auger bits, four-point auger bits and two-point clay bits are available in a number of different sizes . . . all made from Bowdil's specially treated steel for long and efficient service.

DETACHABLE JAW SPIKE PULLER

Small, easy to handle . . . pays for itself many times over. Detachable jaws make it possible to replace claws without delay. The special construction pulls spikes without bending them.

SPROCKETS FOR ALL MINING MACHINES

Bowdil Sprockets are made from special heat-treated alloy steel and designed for hard wear. Our stock of over 100 different styles includes clutch, spline and keyed types—various tooth designs of 4 to 13 teeth.

WANT SOMETHING SPECIAL? BOWDIL CAN BUILD IT

Bowdil has the staff and facilities to work with you on any custom building or rebuilding, engineering, machining, fabricating. Excellent heat-treat equipment. If you have a problem, bring it to Bowdil.

BATTERY OPERATED MINE LOCOMOTIVE DESIGNED AND BUILT BY BOWDIL

SALES ENGINEERS IN—Whitesburg, Kentucky—West Frankfort, Illinois Charleroi, Pennsylvania — Denver, Colorado — Big Stone Gap, Virginia Danville, West Virginia — Canton, Ohio — Birmingham, Alabama Helper, Utah—Kansas City, Missouri—Centerville, Iowa—Topeka, Kansas New Castle, England — Alberta, Canada

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COAL CUTTING EQUIPMENT

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A MESSAGE OF INTEREST TO MINING MANAGEMENT IN EVERY COAL-PRODUCING STATE

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The consistently steady increase in the number of WHEAT Electric Cap Lamp installations in West Virginia marks today's strong and unmistakable trend toward lower lamp-handling costs. WHEAT's *true* self-service *pays*. The facts merit your consideration—let us detail them!

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Algoma Coal & Coke Company
Ames Mining Company
Amherst Coal Company—4
BEM Coal Company—2

Big Eagle Coal Company
Browning Coal Company
Birch Mining Company
Black Band Coal Company
The Carbon Fuel Company

Cedar Grove Collieries, Inc.
Chafin Coal Company
Christian Colliery Company—2
Clean Coal Company
Coolridge Coal Company

Correale Mining Corporation
Crooked Creek Coal Company
Eastern Gas & Fuel Associates—3
Elk Creek Coal Company
Ethel Chilton Mines—2
Farley & Wood Coal Company

Five Block Coal Company
Glogora Coal Company
Glen Eagle Coal Company
Greenbrier Sewell Coal Company
Gulf Smokeless Coal Company
Guyan Eagle Coal Company—3

H & H Coal Company
Hopkins Coal Company
Iman Mining Company
Imperial Smokeless Coal Company
Indian Coal Company

Island Creek Coal Company—3
James Coal Company
Jean Ann Coal Company
King Coal Company
F. M. A. Leach Coal Company

Leccony Smokeless Fuel Company
Lieving Coal Company
Lewis Coal Company
Logan-Chilton Coal Company
Logan County Coal Corporation—5

The Lorado Coal Mining Company—3
Merrill Coal Company—2
Milburn By-Products Coal Company
The New River Company—4
Panther Coal Company of West Virginia

Peasers Branch Coal Company
Phillips Coal Company
Pond Creek Pocahontas Company
Princess Dorothy Coal Company
Raleigh-Wyoming Mining Company
Richwood Sewell Coal Company

Ridgeview Coal Company
Riverton Coal Company
Robinson Run Coal Company
Robey Run Coal Company
Rosedale Coal Company

Semet Solvay Division,
Allied Chemical & Dye Corporation
The Snap Creek Coal Company—2
Sport Coal Company
The Spruce River Coal Company
Starford Coal Company

Sterling Smokeless Coal Company
Stollings Coal Company
Town Creek Coal Company
Turkey Gap Coal & Coke Company
Warner Collieries Company—4

Webb Coal Mining Company
West Fork Collieries, Inc.
West Virginia Brick Company
West Virginia Coal & Coke Corporation
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NOTE: The figure after the company name indicates the number of mines using Wheat Lamps.

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Tungsten Carbide and the Defense Program

Allocation to Mining Will Save Critical Manpower and Steel

By M. L. McCORMACK
Ingersoll-Rand Company
Board of Governors
Manufacturers Division
American Mining Congress

NO other single development of modern times has resulted in greater efficiencies in mining ores of medium and higher hardness than the use of tungsten carbide in cutting and drilling tools. Tungsten carbide has enabled mine operators to make major increases in production without increasing man-hours of drilling time and without adding additional compressed air equipment.

In order to meet today's urgent needs for military production, it has been necessary to limit the use of many critical materials—including *tungsten carbide.* It is the purpose here to outline the basic requirements of this material for drill bits used in the ore mining industries and to justify its use for this purpose.

It is obvious, of course, that increased output of the nation's mines is essential to our war defense needs. Any curtailment or substitution of materials which would impede the flow of vital ores and metals from our mines would hit the country's productive capacity at the very source—and would make itself felt in every segment of defense production activity.

The Defense Production Act of 1950 is so written that only the Defense Establishment, Atomic Energy Commission and certain foreign countries can initiate "DO" or rated orders. The assistance of these, from their doubtful extension through to the mining industry, has so far been slight, and until the law is changed the mining industry will have to depend on specific directives, on a spot basis, for its critical needs.

Based on past experience, it is possible to calculate the number of rock drill bits needed to meet the demands of the mining industry—and to translate these requirements in terms of steel and tungsten carbide used in the manufacture of these bits. The steel requirements, however, vary widely—depending on the type of bit used. The three most important types of rock drill bits currently used in American mining service are:

(1) Tungsten carbide insert bits. These have cutting edges of tungsten carbide—the hardest of all known metallic substances.

(2) Single-use steel bits. As the name implies, these detachable steel bits are used until the cutting edges become dull, and are then discarded and replaced with new ones.

(3) Multiple-use steel bits. These are detachable steel bits that can be re-sharpened and re-used 3-7 times before they have to be discarded.

Where else can more benefit be obtained from a pound of tungsten than in tungsten carbide insert rock drill bits?

It is estimated that the following minimum quantities of steel and tungsten carbide will be required for tungsten carbide insert rock drilling during the next twelve months in domestic mining practice. For purposes of comparison the quantities of steel that would be required for the other two types of bits are shown, assuming that *all* of the drilling was *theoretically* done with either one.

Type of bit	Estimated lb Tungsten Carbide Required	Estimated lb Steel Required
1. Tungsten carbide insert	160,000	1,200,000
2. Single use steel	.....	40,000,000
3. Multiple use steel	.....	20,000,000

It is obvious from the above that an allocation of 160,000 lb of tungsten carbide for rock drill bits alone would result in a maximum saving of 38,800,000 lb of steel—enough to make 6,000,000 rifles or 550 35-ton tanks.

The above estimated quantities of steel do not include an additional conservatively estimated 6,000,000 lb of hollow drill steel that would be saved as a result of the use of tungsten carbide insert bits in the harder ores.

Of much greater importance is the fact that with their present manpower, many mines would find it *impossible* to maintain even existing rates of production if they were forced to abandon tungsten carbide insert bits and revert to the practice of using steel bits.

Show All 'Round Economy

Tungsten carbide insert bits have permitted the mining of ores so resistant to drilling that they could not formerly be mined economically with plain steel bits. The application of tungsten carbide insert bits, however, is not limited to the hardest ores. Many mines with ores of only average hardness have effected major increases in mining efficiency as a result of their use. The reason for this—as well as the tremendous steel savings—will be apparent upon an examination of the radically improved performance of the tungsten carbide insert bit when compared to that of steel bits. *Here are the facts* in drilling and blasting ores of medium and higher hardness, as repeatedly proved in actual service over a wide range of mining operations.

Tungsten carbide insert bits—

Drill 50-100 percent faster.

Increase production 20 percent or more.

Consume 30 percent less drill steel.

Save up to 30 percent on dynamite.

Reduce compressed air requirements at least 40 percent.

Reduce maintenance costs 20-60 percent.

Drill 50-400 times more hole footage per bit.

Permit use of lighter drills, longer steels.

Require less shop equipment.

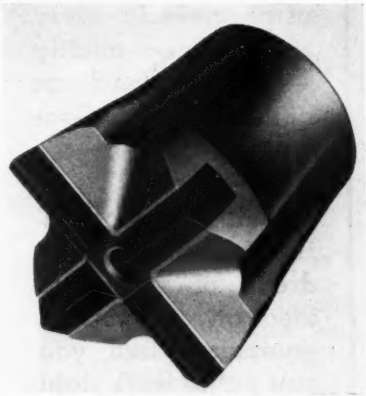
Save up to 50 percent in man-hours.

The above condensed statement of facts will be briefly supported, mindful of the further fact that it is still a matter of decision where the dividing line of hardness currently dictates the application of tungsten carbide.

Manpower—Tungsten carbide insert bits drill from 50-100 percent faster because the cutting edges stay sharp many times longer. This results in higher uniform drilling speed for the full depth of a drill hole of uniform minimum diameter. This frequently means double the footage of blast hole per shift from the same drill crew.

Long Life—It is now a generally accepted fact, by the mining industry, that a tungsten carbide insert bit will drill 100 times as many feet of hole as a hardened carbon steel bit will drill. Actual drilling tests in Barre granite show that an expendable two-in. diam steel bit drills five ft before reaching discard dullness. On the other hand, a two-in. tungsten carbide insert bit drills 500 ft of hole in the same rock with from 3 to 6 retouchings on a grinding wheel.

Explosives — Savings in explosives through the use of tungsten carbide insert bits range from 10-50 percent.

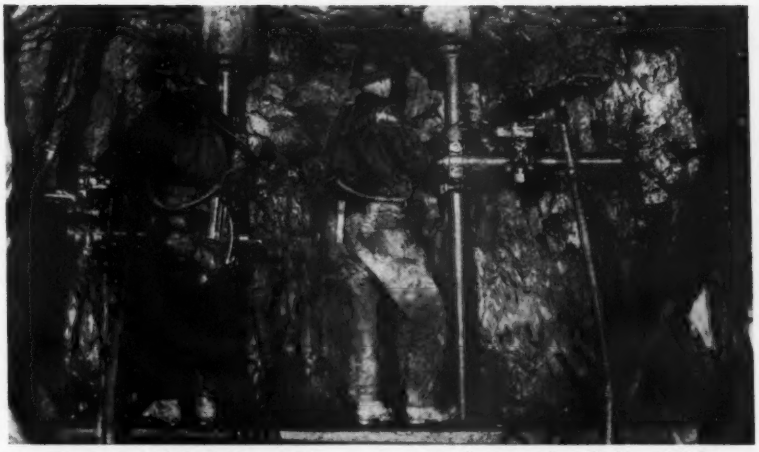


80 tons of tungsten carbide for rock drill bits could save 19,400 tons of steel for the defense program

This is due to the smaller diameter holes possible with these bits. When steel bits are used it is necessary to use a large size starting bit and progressively reduce the diameter of each successive bit until the hole is bottomed at the desired size. One smaller size tungsten carbide insert bit will generally drill out many complete holes.

Compressed Air — Because of the increased drilling speeds in hard rock (50 to 100 percent) resulting from the use of tungsten carbide bits, it is conservatively estimated that a minimum of 40 percent less compressed air is consumed per foot of drilled hole. The savings in compressor plant equipment and power are in the same proportion.

Spare Parts—Records of various mining companies now indicate a saving of well over 30 percent in the number of spare parts required for rock drills using tungsten carbide insert bits as compared to those using steel bits. This represents an additional saving of several thousand tons of high-grade steel.



Tungsten carbide bits save time, money, man-hours and critical materials in mining hard iron ores

Needs Small for Returns

The large, highly productive, self-propelled pneumatic piston drills used in open pit mining would be almost useless without tungsten carbide insert bits.

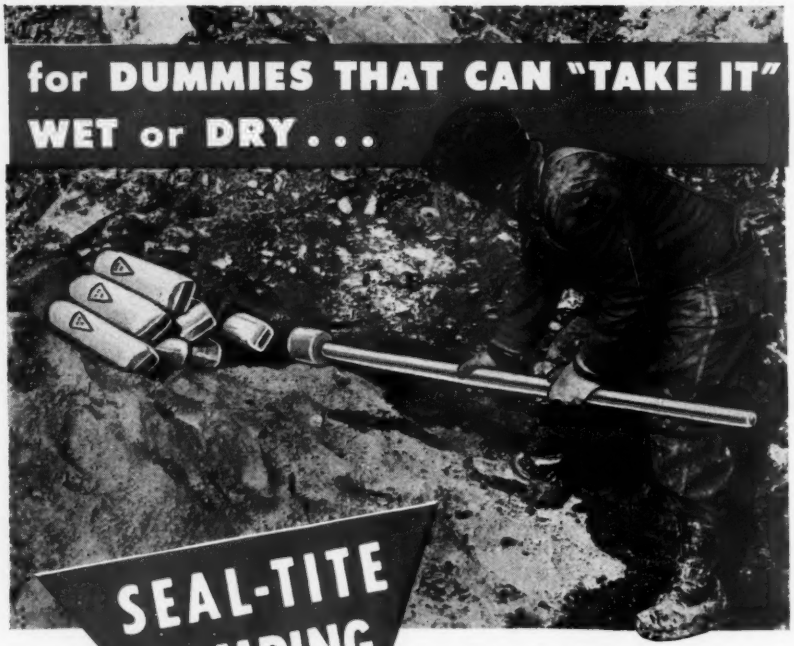
It is estimated that the American iron ore mining industry today uses the annual equivalent of 3,000,000 single-use steel bits in drilling the soft ores and 120,000 tungsten carbide insert bits in drilling the harder ores. If the users of tungsten carbide insert bits were forced to revert to steel bits, the equivalent of 12,000,000 additional single-use steel bits would be required.

Also, many operations have made complete changeovers to lighter rock drills, longer feeds and lighter mountings to take full advantage of these tungsten carbide bits. Other properties are in the process of converting. This lighter equipment would not be suitable for use with ordinary steel bits. If these companies were forced to go back to the use of steel bits, major retooling and additions to compressed air and power plant facilities would be necessary.

It would be facetious to suggest that only soft ores be mined during this emergency period, in order to conserve man-hours and critical tungsten carbide. It is also wishful thinking to suppose that there might be enough tungsten and cobalt for all civilian and military requirements. Some uses must, perforce, be restricted or eliminated in the face of stern reality. By way of perspective, the rock and ore drilling requirements in the form of tungsten carbide account for less than one percent of the tungsten and cobalt estimated as the total civilian requirements. By permitting its use in this field, emphasis is being placed on the head of the pipe line that must be counted on to pour out previously unheard of quantities of metal and mineral products.

Tungsten carbide bits permit economical mining of ore impossible with plain steel bits

for DUMMIES THAT CAN "TAKE IT" WET or DRY . . .



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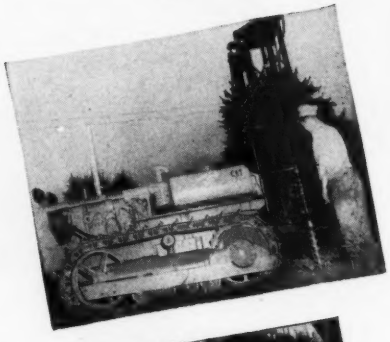

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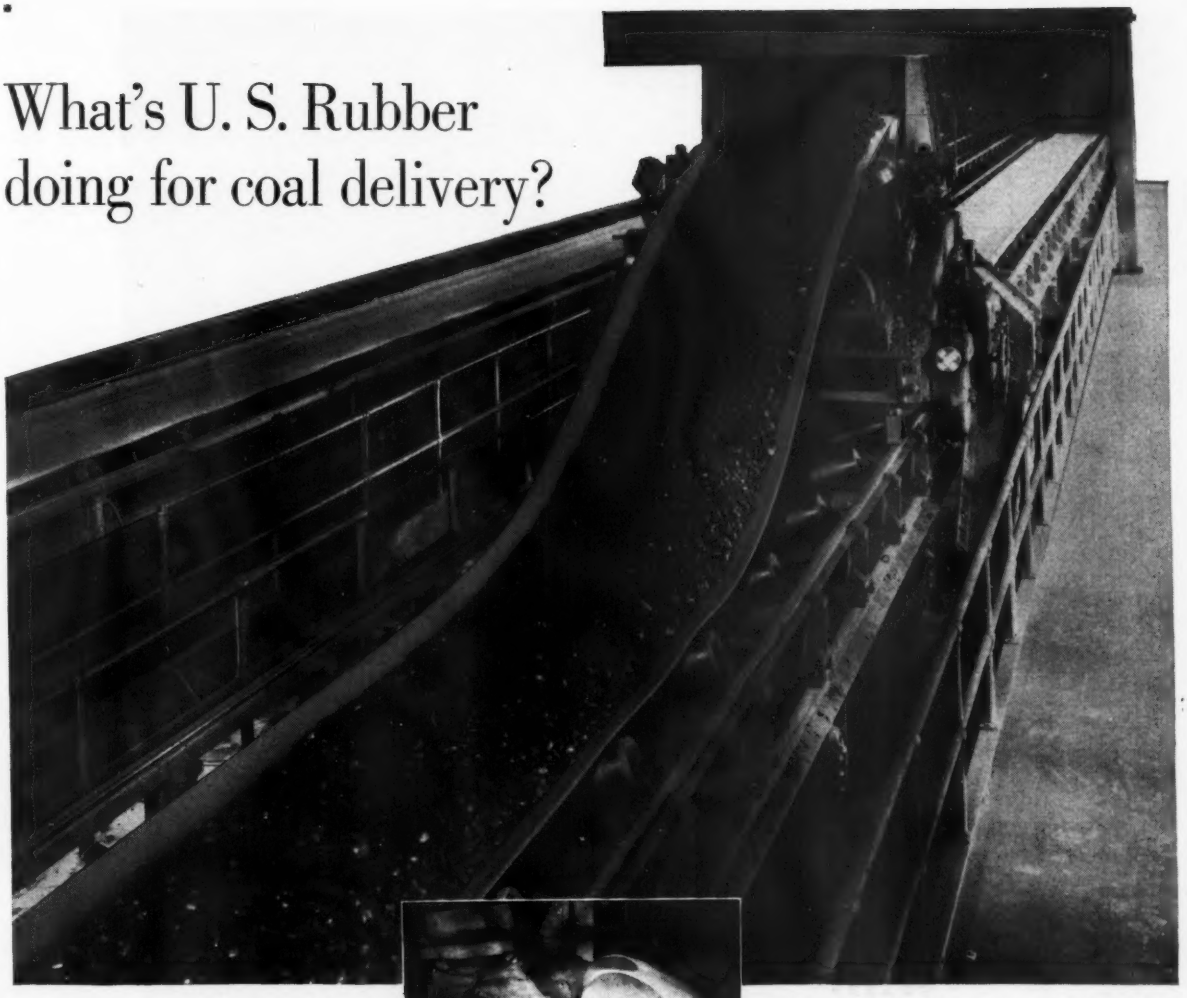
What's U. S. Rubber doing for coal delivery?



THIS NEW U.S. CONVEYOR BELT (above) 42 inches wide, 1,984 feet long, weight 18 tons, replaced the earlier "U.S." belt that had been 21 years on the job. The original belt traveled 231,818 *miles*, almost equivalent to a trip to the moon, before being replaced.

SPLICING ON THE JOB is a U. S. Rubber specialty. It took the man on the left and his fellow-workers 12 hours to install the belt – a record-breaking time—thanks to the cooperative planning between the "U.S." engineers and the operator.

"U.S." makes conveyor belts that last longer. This particular belt installation in a mid-west electrical generating plant replaced a 21-year-old belt that had a record run of service. It can be fully expected to give an even finer performance.

The technical progress made by United States Rubber engineers in belt construction is enabling mine operators and coal handlers to increase output and decrease their operating costs. Your materials-handling problem is never too big or complex for "U.S." belting specialists. Contact them through the address below.

THE OLD U.S. CONVEYOR BELT traveled this near-1000 foot runway at a rate of 360 feet per minute – delivered over 17 million tons of coal – gave continuous trouble-free service in its long history.

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Lower Cost Coal

(*Continued from page* 99)

flexibility and packaging power. All mining and conveying elements are hydraulically operated, which permits the use of high speed and therefore smaller electric motors. The mining element presently installed on the unit follows conventional practice and is designed for plain mechanical efficiency (that is, to remove the seam with the minimum amount of horsepower) and for obtaining a product with a minimum percentage of minus ⅛ in. material.

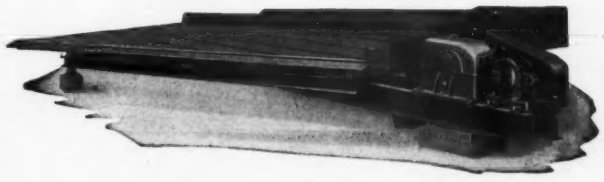
Many of the originations in developing Test Unit No. 2 will have considerable value to the industry for future development of continuous machines and for improvement of present machines. These include: Simple adjustments for changing the mining elements for varying seam heights and expanding or contracting cutting widths for maneuverability or tramming; a burster screw for use with a continuous miner; a rotary self-sharpening cutter bit to lengthen the time between bit changes; determination of the advantages of rigidly held cutting bits over flexible chain mounted bits; employment of high quality steels to provide minimum size with maximum ruggedness; a control system operated from one position so that the machine can be operated continuously; a control system operated from a prone position for thin seam work; and a cat tread with proper degree of thrust for maximum grip and minimum penetration for soft bottom conditions.

It is realized that the machine in its present form will not meet the requirements for all seam conditions. The principle for removing the seam, greater flexiblilty of operation under varying conditions and greater simplicity are some of the problems for further research so that we may accomplish our objective.

For this reason, Test Unit No. 2 has been designed so that the mining element can readily be removed from the chassis and be replaced by another of different operating principle. Test Unit No. 1 which was side-tracked because of the amount of research involved to make it workable, may be an answer to some of the problems. It is now underground for further testing.

Keep the Product Moving

The stages in development of mass production in factories present several analogies to the problems facing us in the development of a continuous mining cycle. In an article written in 1939, Henry Ford described these three stages in its development. The first effort to increase factory output was to increase the units of production —more workers, more hours, more machines. "But," said Mr. Ford, 'mere massing of men and tools was not enough." The coal industry too knows that more men, more working places, more mine cars are not enough. The second stage was the focusing of attention on the actual labor processes, or, as he calls it, the "efficiency expert approach." By time studies and similar methods, the existing labor processes were analyzed to correct and improve them. For instance, now a man could load 47-½ tons of pig iron per day instead of 12-½ tons. What really was needed, of course, was a method whereby a man did not need to load the pig iron at all. This approach he calls the scientific or engineering motive, which by an analysis of the basic problems led directly to the system of assembly line or mass production. His definition of mass production, we would do well always to bear in mind: Mass production is the *planned, orderly* and *continuous progression* of the commodity to completion. Keep the product moving, not the man. This planned, orderly and continuous progression is the answer, in coal mining as it was in manufacturing and can be achieved by the scientific viewpoint, through research into the basic problems of the coal mining process considered as a whole from a scientific angle.



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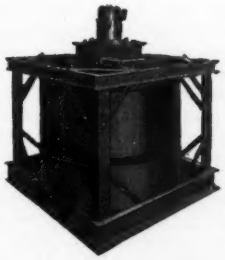

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About 800,000 tons of iron ore can be stocked under ore bridge at Palua. Bridge has span of 320 ft and 13-ton grab bucket

Venezuelan Iron Ore

Shipload from El Pao First Result of the Careful Planning and Ingenious Engineering of Bethlehem Steel Co.

ARRIVAL of the *S. S. Bethore* with the first cargo of iron ore from Venezuela at the plant of the Bethlehem Steel Co., Sparrows Point, Md., marks the culmination of a period of exploration and development which extends over more than fifteen years. When full production is reached the desposit of Iron Mines Co. of Venezuela, at El Pao, State of Bolivar, is scheduled to yield about 3,000,000 tons of iron ore annually. It is also possible, without material changes in layout and equipment, to increase the mine production to 5,000,000 tons a year.

This new supply will help provide the large additional tonnage of ore needed as a result of the 2,600,000-ton increase in Bethlehem's annual steelmaking capacity. Second largest producer in the country, the company now has an annual ingot capacity of 16,000,000 tons.

Preparatory work included the construction of a river loading station and deep-water port, and the building of a fleet of shallow-draft vessels, tugs and barges. Three new communities have been created in the wilderness, a railroad and a highway have been pushed through the jungle, and several hundred miles of river have been sounded, charted and marked with aids to navigation.

Photos courtesy Bethelem Steel Co.

Discovery of the El Pao deposit in 1926 is credited to a native prospector who found a large outcrop of rich iron ore on the summit of a hill known as El Florero. At that time El Pao was nothing but undeveloped jungle, about 30 miles south of San Felix, a small village near the confluence of the Caroni and Orinoco Rivers.

After some preliminary exploratory work Bethlehem Steel Co. acquired the concessions in 1933 and organized the Iron Mines Co. of Venezuela to develop and operate them. Of the first 22 concessions acquired six were relinquished, leaving a total of 16 concessions covering an area of nearly 20,000 acres.

Exploration and mapping, preparation of engineering plans and general layouts for camps, shops, a railroad and highway between the mine and Palua on the Orinoco River were begun in 1937.

Ore is shipped by rail from the mine at El Pao to Palua on the Orinoco River, for storage or loading into shallow draft vessels or barges. These take the ore down the river to the transfer station at Puerto de Hierro, 230 miles away. Here the ore is transferred to the stock pile for loading into ore-carrying vessels at the rate of 3000 tph for shipment to the United States.

War Slowed Construction

Actual construction work started in February 1941 was brought to a virtual standstill during and immediatly following the war years. This delay held work up about five years.

In February 1947, the company acquired two properties on the Gulf of Paria, known as the Valley of Jamaica and the Valley of Carenero, to be used for a transfer station named Puerto de Hierro, or "Iron Port." Construction here was started in May 1947 and completed in July 1950.

The first major step in the building program was the establishment of a construction camp at Palua, with docking accommodations for vessels bringing in machinery and supplies, and adequate warehouse and storage facilities. A 50-ton stiffleg derrick was erected on the river bank, for use in unloading cargo.

With the completion of a 30-mile two-lane gravel road from Palua to El Pao, early in 1944, work on the mining camp could proceed. Construction

of the single-track railroad to the mine was also started at the same time, and the last spike was driven on June 1, 1950.

The total length of the railroad is 38.7 miles, of which 34.8 miles are main-line track. It climbs about 1600 ft on its way up to the mine. Of the total trackage, 21 miles is curved and super elevated; maximum curve is 11 deg U. S. standard, and maximum grade 2 percent, compensated for curvature There are six short-span steel-girder bridges, five arch culverts and 12 box culverts. Five sidings are provided for passing. Track is U. S. standard gauge with 100-lb rails.

Over 1,500,000 cu yds of earth and rock had to be moved in the construction of the railroad. Two quarries with a crushing plant were opened, one at each end, to supply granite ballast for the road bed. Imported creosoted pine ties were found to be the most economical and satisfactory for service in the tropics.

Main-line haulage equipment consists of three 130-ton, 1500-hp Diesel-electric locomotives with dynamic braking; 100 70-ton bottom-dump ore cars and miscellaneous flat cars, box cars and tank cars.

Ore High Grade Hematite

Ore is hard, massive hematite, 63-66 percent iron, as shipped. It is of a type that may be used either in blast furnaces, or open hearths. The main deposit, now being mined, is a bowl-shaped formation about 2600 ft long and 1700 ft wide, on top of a hill rising several hundred feet above the surrounding country. The center of the bowl-like formation is filled with an overburden consisting mainly of clay, with some igneous material; this is up to 425 ft thick and must be stripped before the ore can be mined. The ore body itself varies from a few feet to approximately 400 ft in thickness.

Other ore bodies within the concessions will be mined later, but sufficient diamond drilling has not yet been completed to determine their size.

In this interesting article is presented the story of the deposit of the Iron Mines Co. of Venezuela at El Pao in the State of Bolivar, Venezuela. Scheduled to supply 3,000,000 tons of 60-66 percent iron open hearth and blast furnace ore annually, it will help provide the feed required for Bethlehem's 2,600,000-ton increase in annual steel-making capacity. Solutions of loading problems posed by a 43-ft seasonal rise and fall in the water level of the Orinoco River, by the more than 200-mile distance from mine to Atlantic Ocean and the 1600-ft difference in elevation between ends of the 38.7-mile railroad are a tribute to engineering skill and a source of ideas and inspiration to other engineers.

Open Pit Mining Used

The mining method adopted is one of slicing off the top of the hill in 13-meter (42.6 ft) high benches by standard open-pit methods. Eventually, due to the shape of the ore body, a pit will be excavated within the hill. Actual mining operations were started in August 1950 and are now being carried out on the two upper benches where the ore is exposed at the surface, with no overburden to remove. Stripping of overburden will begin shortly and progress with the mining of the various levels. Present estimates indicate that one cu yd of overburden will have to be removed for every 4.2 tons of ore mined.

Primary drilling in the ore is done with crawler-mounted electric churn drills with 9-in. diam bits. The upper portion of the ore body now being mined is badly fractured, and this combined with the extreme hardness of the ore, presents a very difficult drilling problem.

Secondary drilling is presently being done with pneumatic wagon drills and jack hammers with "one use" and tungsten-carbide insert detachable bits. A steel drop ball will also be used for secondary breakage where practicable.

At present all blasting is done with 60 per cent straight gelatin dynamite, detonating fuse and electric blasting caps. Other types of explosives are being tested to determine the type most economical and efficient under prevailing conditions.

Ore Crushed at Mine

Ore and overburden are handled by four electric shovels with 4-cu-yd dippers and Ward-Leonard control. The ore is loaded into ten 30-ton, side-dump semi-trailers hauled by 200-hp Diesel-engine powered tractor trucks. The heavily loaded trucks travel about one mile down an 8 percent grade to the crushing plant. A special hydraulic retarding unit supplements the regular brakes on the down hill haul. The trucks are dumped at the crusher by a fixed overhead crane which permits control of the rate of feed to the crusher.

Primary crushing is done in a 54 by 84-in. Blake-type jaw crusher powered by a 350-hp electric motor through V-belt drive. Set to crush to 6-in. the crusher has a capacity of 900 tph.

The jaw crusher discharges directly onto a 42-in. rubber belt conveyor, 179 ft long, running at 370 fpm and delivers the ore to a 2⅜-in. grizzly at the secondary crushers. Oversize from the grizzly flows into two 5 ft 6 in. gyratory crushers, each with a capac-

Three traveling towers can unload ore barges at Puerto de Hierro at 1200 tph rate

Ore from 30-ton trucks is dumped into primary crusher at El Pao

A 33 car train is loaded in little over half an hour at El Pao mine's ore bin

ity of 440 tph set to crush to 2½ in., or by-passes the gyratories as open-hearth lump.

Gyratory discharge and the undersize from the grizzly are combined on a 42-in. belt convepor, 426 ft long, running at 370 fpm discharging onto a 2⅜-in. grizzly on top of the ore-loading bin at the rail head. This bin, a large steel structure, has a capacity of 4000 tons and is divided into three compartments to permit separate handling of blast furnace ore and open hearth lump ore.

Ore is drawn from the bottom of the bin through six air-cylinder operated gates into railroad cars on a double track under the bin. A 70-ton car can be loaded in about one minute.

Normally a train is made up of 30-33 cars, 36 cars maximum, drawn by one locomotive. With an annual production of 3,000,000 tons of ore, four trains will be run from the mine to Palua every working day. Due to the steep down-grades the heavily loaded trains must travel at moderate speed, negotiating the trip to Palua in a little over two hours.

River Port Poses Problems

At Palua the loaded trains are run onto a plate-girder steel trestle over a 550-ft long, 43-ft deep pocket excavated in the solid rock parallel to the Orinoco River bank. Ore from the bottom-dump cars is discharged into the pocket which has a live-storage capacity of 27,500 tons with an extra 16,500 tons dead-storage capacity.

An additional 800,000 tons of ore can be stocked under a 13-ton ore bridge which overhangs the ore pocket and operates on tracks parallel with it. The bridge has a span of 320 ft and 146 ft and 95-ft cantilevers.

Underneath the storage pocket is a 660-ft reinforced-concrete tunnel with 20 4 by 4-ft air-operated chute gates in the roof, through which the ore is drawn from the pocket through three roll-type feeders and delivered to a 48-in. rubber belt conveyor, 617 ft long, which travels through the tunnel at a speed of 450 fpm.

To prevent surges of ore from flooding the belt the feeders are interlocked with the gate mechanism by electric relays in such a manner that it is impossible to open a gate unless a feeder is in the correct position underneath, with the drum revolving.

The tunnel conveyor discharges the ore to a second 48-in. belt, 537 ft long, built at right angles to the ore pocket. Conveyor No. 2 travels at 450 fpm onto a 416-ft long steel loading structure which cantilevers out over the Orinoco River.

Directly underneath the second conveyor and parallel with it, is a 141-ft long 48-in. shuttle conveyor, operating at 455 fpm, which discharges the ore through a telescoping steel chute directly into the vessels moored below. This conveyor has a travel of 64 ft, sufficient for proper trimming of the vessels being loaded.

This method of loading was made necessary by the large seasonal variation in the water level of the Orinoco River, nearly 43 ft at Palua, which makes it impracticable to load the vessels from an ordinary wharf structure.

Five 4500-ton barges with 14-ft loaded draft and one twin-screw river vessel of 8500-ton capacity at maximum draft, the *Punta Aramaya*, are used to transport the ore from Palua to tidewater. A second river vessel, the *Punta Morocoto*, will be in service by April of this year. A third vessel has been authorized.

To provide a mooring platform with the necessary equipment for shifting the vessels during loading a floating dock has been developed. This dock is 480 ft long and is made up from six articulated 80 by 20-ft sections pinned together. Each section is constructed of 24-in. wide-flange beams and floats on four steel pontoons, 20 by 7½ ft, 4½ ft deep, any of which may be removed for maintenance and replaced without interference with the operation of the dock.

The dock is held in position by six anchor chains. In order to provide sufficient depth of water over the chains, these are fastened a considerable distance back of the fender line to anchor sections pinned to the dock. A chain to the shore at each end and two diagonal chains for securing the dock longitudinally complete the anchorages. The river anchors were dragged and the chain prestressed to a 50-ton pull, adjusted to proper position, and fastened permanently to the dock.

This arrangement gives the dock full freedom to move up and down

with the rise and fall of the river. It is remarkably stable, requires no adjustment, has excellent shock-absorbing properties, is inexpensive to construct, and may be painted and maintained without interrupting service.

The barges, which operate only during the season of high water, from April to November, are towed to Puerto de Hierro by 1300-hp ocean-going tugs, the *Patao* and the *Capure*. They travel via Cano Manamo past Pedernales and across the Gulf of Paria, a distance of 230 miles.

Due to their greater draft the *Punta Aramaya* and her sister ships must travel the 395-mile route through the main channel of the Orinoco—the Boca Grande—and up the coast. During the season of high water they may return empty to Palua by the shorter Pedernales route.

Normally the barges will make the round trip in three days, as will the larger vessels when they can use the shorter route back to Palua.

As a preliminary to shipping, the company surveyed and sounded both branches of the river and installed over a hundred beacons and buoys to aid navigation.

Tidewater Terminal Large

Selection of Puerto de Hierro as terminus for the river craft was made after a thorough search along the coast for a suitable location for docking and loading the 26,000 net ton ore carriers, with adequate space for ore storage and the extensive shore installations required to maintain the port.

Due to foundation conditions, it was decided to locate the heavy stock pile far enough inland to guarantee stability. Such an arrangement required a pier where barges and river vessels could be unloaded and where ocean-going vessels could be loaded at the same time if necessary.

A flexible type pier of steel construction, resting on steel H-piles, was found best suited for supporting the heavy, concentrated loads of the loading and unloading towers.

Ground borings showed a sand bottom under the mud in the bay, and load tests on piling indicated that loads in excess of 100 tons per pile could be adopted in the pier design. Before construction on the pier was started, the bay was dredged to a maximum depth of 42 ft below low water.

The main pier structure and ramp is 785 ft long and 80 ft wide, and is supported on 239 14BP 102-lb steel H-piles. The superstructure consists of heavy steel framing welded to the piles and a deck of continuous reinforced concrete integral with the steel framing. This makes the whole pier act as a monolithic structure combining great strength and flexibility.

A 150-ft approach of similar construction provides two truck lanes for access to the pier. Three 30-ft diam circular dolphins made of steel sheet piling keep the ships in proper channel and protect the pier from head-on impact.

Barges and river steamers are placed end to end along the west side of the pier and unloaded by three traveling rope unloading towers with 8-ton grab buckets. The towers, which have an average combined capacity of about 1200 tons per hour discharge the ore onto a 48-in. rubber belt, 1852 ft long in two flights, and traveling at 500 fpm. The conveyor leads from the pier over a trestle where the ore is discharged by a traveling-boom tripper onto a storage pile over a loading conveyor tunnel. The storage pile has 80,000 tons live capacity. An additional 1,200,000 tons may be stocked in an adjacent area under a 13-ton ore bridge with 320-ft span.

Mayari R high-strength steel was used in the construction of the unloaders, in order to decrease their weight. The high corrosion resistance of this steel was also a contributing factor in its selection. Each tower weighs approximately 400 tons.

Ore is drawn from storage into a 710-ft long concrete tunnel, similar to that at Palua, through 18 chute gates. Three roll feeders place the ore on a 992-ft, 48-in. belt traveling at 500 fpm, and discharging onto a 48-in. pier loading conveyor, 811 ft long. This passes through a traveling-boom tower which loads the ore into the holds of the ocean-going ore vessels berthed on the east side of the pier.

It requires about 10 hours to load the 26,000 net-ton vessels which make the 1950-mile journey to Sparrows Point, and back, in about 13 days.

Three Power Stations

Electric power for El Pao, Palua and Puerto de Hierro is generated at 2400 volts and 60 cycles in three separate Diesel-electric power stations. The El Pao station has three 980-kw generators and two smaller units of 250-kw and 66-kw capacity, respectively. Palua has three 250-kw and one 66-kw generators, as well as a 500-kw dc generator which supplies power for the ore bridge. Four 980-kw generators, supplemented by a

(*Continued on page* 124)

Workers' village, ore storage and dock at Puerto de Hierro on the Gulf of Paria

Wheels of GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

SINCE the House of Representatives resumed operation April 2, following sojourns of its members in the home districts over the Easter vacation, there has been an improved trend toward economy in the legislative attitude.

The Administration's $850 million emergency budget for non-military defense programs was chopped down 43 percent by the Committee on Appropriations. This is really unprecedented and shows determination to act aggressively. The attitude of the House and its Committee on Ways and Means toward Administration revenue demands was also apparent in the reception accorded Treasury Secretary Snyder in his April 2 appearance before the Committee. Taking heed of the Congressional feeling the Administration through Snyder repeated its request for a $10 billion levy, but withdrew its previous proposal for an additional $6.5 billion in revenue.

Taxation

The Ways and Means Committee now has the tax proposals of the Administration and the testimony of industry and other witnesses under executive consideration. It is expected that a revenue bill will be reported next month with final enactment along in the fall.

Secretary Snyder on April 2 stated that increased revenues and reduced government spending would create a $3 billion surplus instead of an anticipated $2.7 billion deficit for the current fiscal year. This prompted Committee Chairman Doughton to inquire, "If the Appropriations Committee could cut appropriations by $3, 4, or 5 billion, could this Committee safely reduce the tax bill by that amount?" Snyder replied that he would be very hesitant to say that a proposed tax increase could be reduced on that basis. In his testimony he touched very lightly on his previous "loopholes plugging" demand, merely asking that as many of these revisions be included as could be handled without unduly delaying the bill.

Speaking for the U. S. Chamber of Commerce, Ellsworth C. Alvord recently told the Ways and Means Committee that the new tax bill should be limited to $5 billion.

Amortization

Testifying on amortization of emergency facilities before the same Committee on March 20, William H. Harrison, Administrator of Defense Production, stated that such tax benefits constitute "probably the greatest incentive" in existence for the expansion of essential industries. He said that up to March 13 certificates of necessity allowing for the accelerated depreciation allowances had been issued covering $3.5 billion of expansion costs.

On March 5 Rep. Simpson (Rep., Pa.) questioned AMC Tax Committee Chairman H. B. Fernald, who was appearing before the Committee, at considerable length concerning these amortization provisions in the Revenue Act of 1950. Simpson and other members of the Committee registered agreement with Fernald, who had recommended that the law be clarified so as to leave no question that 100 percent amortization of a facility is allowable.

In a memorandum which Harrison had previously furnished to the joint Senate-House Economic Committee, he emphasized that as a matter of general policy the Defense Production Administration has certified new facilities for 100 percent amortization when it was clear that their economic usefulness would end with the emergency. He took the position that 100 percent certification of all emergency facilities was not intended by the Congress.

★ ★ ★ ★ ★ ★ ★ Washington Highlights

CONGRESS: Cutting appropriations.
TAX: Single bill only.
AMORTIZATION: Full allowance questioned.
RENEGOTIATION: Enacted.
SOCIAL SECURITY: Would expand compensation.
TRADE AGREEMENTS: Senate hearings close.
MANPOWER: Mining recognized.
MINERAL PROGRAMS: Defense agencies active.

★ ★ ★ ★ ★ ★ ★

Renegotiation

On March 23 the President approved H. R. 1724, the Renegotiation Act of 1951, as Public Law No. 9. This brought to a successful conclusion the sustained efforts on the part of the mineral raw materials industries to have included in this law a mandatory exemption for "any contract or subcontract for the product of a mine, oil or gas well, or other mineral or natural deposit, or timber, which has not been processed, refined, or treated beyond the first form or state suitable for industrial use."

The Office of Public Information, Department of Defense, Washington 25, D. C. has prepared a "Fact Sheet On Contract Renegotiation" which carries essential information on the subject.

Social Security

A rash of unemployment compensation bills has been introduced by Rep. Forand (Dem., R. I.) in a revival of the drive to expand this Federal program. One measure would extend coverage under the Act to any employer with one or more employes, instead of the minimum of eight as at present. Another would increase the

earnings subject to the Act from $3,000 to $3,600.

One of these bills would affect mine "leasers." It would redefine the term "employe" to substitute the so-called "A-B-C" tests for the common law principles of employe-employer relationship. Under these tests an employer, in order to prove that a person is not his employe, must show that (a) the person is free from control and direction, both under the contract of service and in fact; (b) the service is performed outside the usual course of the employer's business, or is performed outside of all the places of business of the enterprise for which the service is performed; and (c) such person is customarily engaged in an independently established trade, occupation, profession, or business of the same nature as that involved in the service performed.

The remainder of these bills would: (1) authorize unemployment benefits to be paid to Federal civilian employes; (2) direct the Secretary of Labor to refuse to authorize grants to any States to meet administrative costs unless the State's unemployment law provides for adequate measures for preventing fraudulent and improper payments of unemployment compensation benefits; (3) repeal the Knowland amendment to the Social Security Act of 1950 (H. R. 6000) which prevents the Secretary of Labor from withholding unemployment compensation funds from a State until the highest State court rules as to whether or not State actions conform to Federal law.

The splitting of these amendments into so many bills is apparently a strategic effort to secure enactment of the program part by part.

Trade Agreements

Further Finance Committee hearings on the Foreign Trade Agreements Extension bill concluded April 6, and executive consideration of the measure is scheduled for the week of April 16.

The Committee has continued to inquire critically of Winthrop G. Brown, chief of the State Department's Office of International Trade Policy. Senator Millikin (Rep., Colo.) emphasized that the State Department has failed to maintain the integrity of tariff rates established in trade negotiations by its failure to consider the effect of foreign currency devaluations. Brown continued to maintain that "escape clause" procedure is the means provided under the Trade Agreements Act to offset effects of currency devaluations. He also contended that the Government has recourse to the International Monetary Fund in the event that foreign currency devaluations are found to be harmful to the best interests of the United States. Brown testified that the State Department is "not optimistic" over negotiating a new trade agreement with Great Britain in the negotiations now under way at Torquay and that these negotiations may be completed by April 20.

Further witnesses heard by the Committee included Oscar B. Ryder, chairman, U. S. Tariff Commission and Frank A. Southard, Jr., executive director of the International Monetary Fund and special assistant to the Secretary of the Treasury.

On April 6 the House approved the Mills (Dem., Ark.) bill suspending the import tax on copper from April 1, 1951 to February 15, 1953. This measure carries the provision that the President must reimpose the tax within 35 days, if the average price of electrolytic copper falls below 24 cents a pound for any calendar month.

Manpower

Of interest to mining, milling, smelting, refining and processing operations is the April 7 revised list of "essential activities" issued by the Department of Commerce as a guide for deferment from military service. The list was issued as an aid in determination of military draft deferments and the calling of reservists and National Guardsmen to active duty. A supplement to the Labor Department list of last August covering "critical occupations" will be issued in the near future.

The Commerce Department has stated that the revised essential activity list includes only those fields which have been determined to be: (1) Essential to the defense program or to the minimum civilian health, safety or interest; (2) inadequate to meet defense and minimum civilian requirements, or for which a seriously short supply is indicated; and (3) the current level of employment in the activity must be maintained or increased.

Included in the new list are the mining and milling of the following metallic and nonmetallic minerals: aluminum, antimony, asbestos, beryllium, bismuth, borates, bromine, cadmium, cerium, chromium, cobalt columbium copper, cryolite, fluorspar, graphite, grinding pebbles, iron, kyanite, lead, lithium, magnesite, magnesium, manganese, mercury, mica, molybdenum, monozite, nickel, phosphate rock, platinum, potash, sodium, strontium, sulphur, tantalum, tin, titanium, tungsten, zinc, and coal mining.

Other activities included are smelting, refining and processing of metal; production of machinery and equipment; production of chemical and allied products; certain stone, clay and glass products; petroleum, natural gas, and petroleum and coal products; transportation equipment; industrial services (maintenance and repair); transportation services; educational and research services.

Metal and Mineral Programs

DPA Administrator William H. Harrison has told a House Appropriations subcommittee that $1 billion will be required between now and June 30 for loans to steel companies and that $208 million will be needed for Interior Department loans to mineral producers, coal and coke producers and oil refineries.

Effective April 6 is the OPS Ceiling Price Regulation 19, setting the ceiling price f.o.b. shipping point for tungsten concentrates at $65 per short ton unit. This ceiling price was adopted largely upon the advice of the Defense Minerals Administration to stimulate tungsten production.

Sparked by Rep. Clair Engle (Dem., Calif.), an airing of the status of aid to mining under the defense production program was had at hearings before a House Mines and Mining subcommittee April 4, 5, and 6. As the hearing opened Engle said he hoped the subcommittee could determine whether the defense minerals production program is as much of a failure as it is believed to be in the far west, and whether its policies are determined by those who are opposed to the objectives of the Defense Production Act "as it relates to the encouragement of the exploration, development and mining of critical and strategic minerals and metals." He indicated that the subcommittee might ultimately wish to recommend that the program be removed from the Department of Interior and put in a single agency directly responsible to ODM's director Wilson. Engle charged that the Defense Minerals Administration is so far down in administrative agency rank that its programs are bottlenecked by the agencies above.

DMA Administrator James Boyd cited the tungsten program, including a government guaranteed floor price of $63 per unit, as an example of efforts to stimulate the smaller units of the mining industry. In discussing the DMA program Boyd stated that his agency has handled thousands of individual expediting actions to assure a continued flow of machinery, supplies and equipment to existing mines and has been active in securing adequate recognition of the industry's manpower problems by the Departments of Labor and Defense.

Answering criticism by subcommittee members of the delay in executing the minerals program, Boyd explained this has been due to the necessity of bringing the anticipated defense and essential civilian requirements and the expected supplies into balance. Since international supply contributes to a high degree to U. S. needs, he said, many of these matters must be resolved before DMA can formulate

(*Continued on page* 138)

Venezuelan Iron Ore

(*Continued from page* 121)

250-kw and a 66-kw unit produce power at Puerto de Hierro. Dc power for the ore bridge is supplied by an ignitron rectifier. Electric power for lighting and similar uses is supplied by suitable transformers.

Compressed air for the mine is produced in two 1400 cu cfm Diesel-engine driven compressors.

Modern Housing for Employes

During the peak of construction the company had nearly 1600 men working in three camps, while about 800 additional were employed by an outside contractor. Today, with all major construction projects completed, the force has dropped to a little over 1000 men.

The problem of providing housing and other facilities for this number of men in completely undeveloped areas was one of major proportions. The first shelters were necessarily improvised and rather primitive. Today, however, the three communities offer adequate living quarters for all.

Palua, the oldest of the settlements, has already taken on the finished appearance which only comes with time. The main street is lined with full-grown trees, and yards abound in shrubbery and flowers. El Pao and Puerto de Hierro still have a new look, but efforts to make them home-like and attractive are in evidence everywhere.

Two-family houses are provided for workmen, and single dwellings for foremen, office workers and the staff. Practically all houses are one-story, of a construction adapted to the tropical climate—cool, fully screened, and termite proof. All have electric light, modern plumbing, and sewer connection. The villages are laid out with wide, well-lighted, hard-surfaced streets.

Water of excellent quality is furnished in sufficient quantity to satisfy the needs of any community of equal size. El Pao gets its supply from the Caroni River, pumped through a 23-mile, 8-in. pipe line to a reservoir of 11,000,000 gal capacity. A local spring also feeds the reservoir. Palua draws water from the Orinoco, and Puerto de Hierro from a dammed-up mountain stream three miles away. All water passes through modern treatment plants before it is distributed.

A sewage treatment plant with digesters, filters, and provisions for disposal of sludges and chlorinated effluent is being operated at El Pao.

Attractive schools with light, cheerful classrooms and sanitary washrooms have been built in all villages. The company pays all expenses of maintaining the schools, including teachers' salaries and books and supplies. Appointment of teachers and all administration, however, are functions of the Venezuelan government.

A large club house for workers, with equipment for showing motion pictures, soda fountain, dance floor, rest rooms and other accommodations has just been completed at Puerto de Hierro. A similar building and a municipal building are also projected for El Pao. Club houses are provided for the staff.

Clean, sanitary commissaries are operated in all communities. These have walk-in refrigerated storage boxes for meat, fruit and vegetables, and are well stocked with groceries, shoes, and dry goods. Space is also made available for native merchants in the villages.

Many of the workers who were employed by the company during the construction era have cleared tracts in the jungle along the railroad and highway. Here they have settled down on small farms where they raise corn, bananas, yams, beans and other fruits and vegetables for which they find a ready market in the villages.

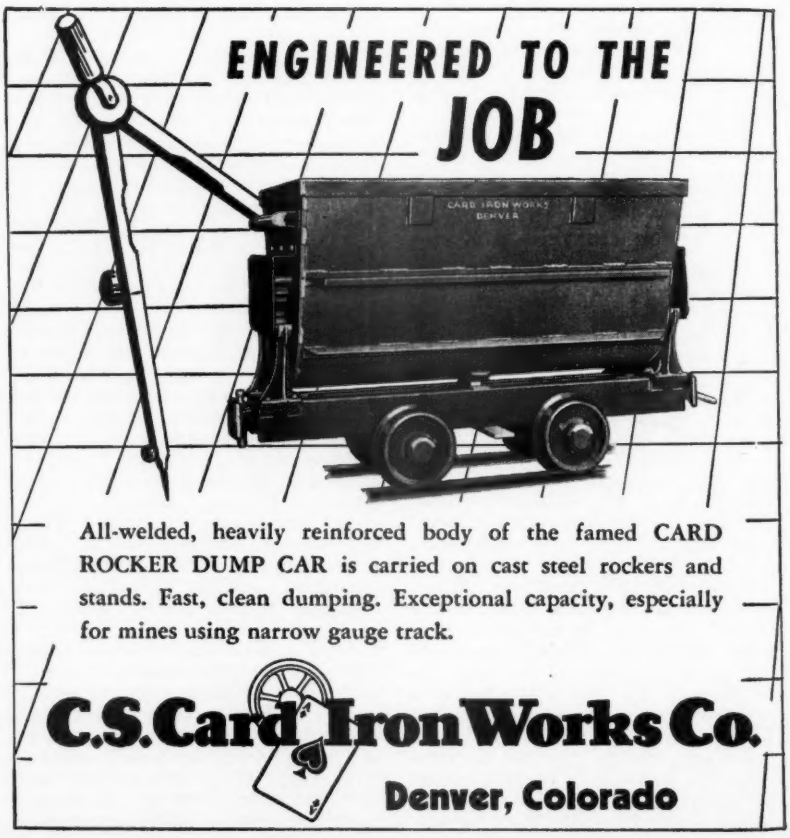
Medical Service Free

Medical service and hospitalization are free to all employes and their families. A hospital with 24 beds for the mine and river port is maintained at Palua, and a 14-bed hospital at Puerto de Hierro. Both have well-equipped operating rooms and modern X-ray and therapeutic facilities, and all types of serum and vaccines are kept on hand. Two doctors, with a staff of nurses are in attendance at each place. A 24-bed hospital is under construction at El Pao.

In spite of the proximity to the equator, all camps enjoy a pleasant, healthful climate. The midday heat is usually tempered by gentle breezes, the humidity is low, and the nights are refreshingly cool. Use of DDT and other precautionary measures have proved very successful in combatting malaria.

One of the major maintenance problems encountered is that of keeping the jungle from encroaching upon the highway and the railroad. A gang of workers with machettes is kept constantly busy cutting down the growth. Experiments are now being conducted with chemical eradicators and weed killers.

Communication with the outside world is mainly by airplane. The company has built an airfield at San Felix, 2½ miles from Palua, which it maintains for daily use by commercial airlines. Puerto de Hierro has daily connection by means of company launches, free to all, with nearby Guiria and its adjoining airfield.



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Denver, Colorado

AMC Personals

Dr. **J. Robert Van Pelt**, mining engineer and research executive, has been named president of the Montana School of Mines at Butte, Mont. He succeeds the late Dr. Francis A. Thomson, who retired last October 1. In the interim **Prof. Arthur E. Adami**, vice-president and dean of the school, has been acting-president. Dr. Van Pelt, a graduate of Cornell of Iowa, the Michigan College of Mines and University of Chicago, has been identified with engineering education and research. He served on the staff of the Rosenwald Industrial Museum in Chicago, now the Museum of Science and Industry, from 1928 to 1945, when he joined the staff of the Battelle Memorial Institute of Columbus, Ohio.

James H. Obear and **Walter R. Schott** have been appointed assistant vice-presidents of the Enos Coal Mining Co.

Raymond E. Petty was appointed foreman of the limestone mine being developed at Zanesville, Ohio, by Pittsburgh Plate Glass Co.'s Columbia cement division.

T. G. Gerow will become president of West Virginia Coal & Coke Corp., succeeding **Charles Dorrance**, who retires on April 18. Mr. Dorrance will continue as a director and member of the executive committee of the company. Mr. Gerow is presently serving as director and executive vice-president of the Truax-Traer Coal Co.

Stuyvesant Peabody, Jr., president of Peabody Coal Co., announced the promotions of **C. S. Ellis**, vice-president in charge of accounting, to senior vice-president in charge of finance and cost contracts, and **Gordon G. Crowder** assistant vice-president in charge of accounting and auditor, to vice-president in charge of accounting. **Joseph LeSanche** will succeed Mr. Crowder as auditor. **Joseph G. Solari**, secretary, will become, in addition, assistant to the president.

Edward Wisser, geologist, and **K. G. Schwegler**, mining engineer, have announced their association as Wisser and Schwegler, mining and geological consultants. Their offices will be located at 422 Acheson Building, 2131 University Ave., Berkeley 4, Calif.

Secretary of the Interior Oscar L. Chapman made the following appointments in the Defense Solid Fuels Administration:

Fred K. Presser was named consultant in the office of Administrator Charles W. Connor; **Donald E. McBrien** was appointed assistant director of the coke division, and **Harold J. Sloman** made industrial specialist (coal and coke) in the industry finance division.

Gordon T. Brown of Caldwell, Idaho, has been named mine engineer for the Copper Canyon Mines Co., at Battle Mountain, Nev. He had previously been associated with Mountain City Copper Co., Cerro de Pasco Mining Co., and the Bunker Hill & Sullivan Mining & Concentrating Co.

Elmer J. Boer, formerly with Battelle Memorial Institute, has been named to the engineering staff of Bituminous Coal Research, Inc. His duties as development engineer with BCR will utilize these specialties toward advancing research in heat and power generation for commercial, small industrial and electric utility coal markets.

Joseph H. Hedges, veteran mining engineer of 25 years' service with the Bureau of Mines, was named a special assistant to Director James Boyd. He will carry out various special assignments, including the expediting of Bureau programs and activities relating to the production of strategic materials. **Howell B. Moon** will succeed Mr. Hedges as chief of the Minerals Division.

Carl M. Riefkin has been elected vice-president of the Newport Steel Corp. He has been associated with the steel operations at Newport, Ky., for the past 27 years.

Clinchfield Coal Corp. has announced the following changes in its personnel. **R. T. Huffman**, superintendent of Meade mine, has been transferred to a group of mines in the Beckley area as general superintendent. Mr. Huffman's position at Meade has been filled by the promotion of **Irwin Sampson**, formerly assistant superintendent. **Charles Lyttle** moves up to assistant superintendent, and **Leslie Clark** to general mine foreman. **A. L. Flowers**, assistant superintendent at Moss mine, has been transferred to Dante as assistant mining engineer. **P. P. Ferretti**, formerly production engineer, replaces Mr. Flowers. **William Maratta** succeeds Mr. Ferretti.

W. H. H. Cranmer, president of New Park Mining Co., has been named to the lead committee advising the Defense Minerals Administration on production and supply of the metal.

Dr. Edward Steidle, Dean of the School of Mineral Industries, Pennsylvania State College, has been elected a member of the National Committee on Policies in Conservation Education, an independent organization to promote the teaching of conservation in the schools.

R. L. McCann was elected president of the New Jersey Zinc Co. He succeeds **Henry Hardenbergh**, who becomes chairman of the board of directors. Mr. Hardenbergh has been president of the company since 1943. Mr. McCann, formerly general manager of mines of the company, was appointed assistant to the president in January 1949, and elected vice-president in March 1950.

R. L. McCann

Alex C. Burr, director of the North Dakota Research Foundation, has been named by Russell C. Warner, president of the National Council of State Boards of Engineering Examiners, to be a member of the National Bureau of Engineering Registration. Burr has been a member of the North Dakota board of registration since its organization and is chief of the fuel technology division for Region V of the U. S. Bureau of Mines.

George Bergeson has been named supervisor of safety of the combined Mesabi range safety departments of the M. A. Hanna Co. and Butler Brothers at Hibbing, Minn.

Robert C. Tyson, comptroller of United States Steel Co., has been elected a vice-president of the company. In addition to his new duties he will continue as comptroller.

J. W. Woomer, consulting mining engineer of Pittsburgh, Pa., and Wheeling, W. Va., is spending several weeks in France and Germany observing potash mining practices and potash metallurgy. Mr. Woomer is on an assignment for Southwest Potash Corp. of New York City.

Arthur P. Cortelyou has been appointed general manager of U. S. Vanadium Corp., a division of Union Carbide and Carbon Corp. **R. M. Mahoney,** formerly of the company's Pine Creek operations near Bishop, Calif., has been transferred to New York, where he will continue to be in charge of the industrial relations activities.

Waldemar F. Dietrich, Sacramento, Calif., has been made chief of the Rare and Precious Metals Division of the USBM. He is senior member of the firm of Dietrich, Morse & Associates, consulting engineers, Sacramento. He has served as a bureau consultant in Alaska and spent a year in the USBM metallurgical division at Rolla, Mo.

John B. Keeler, manager of the traffic and transportation department of Koppers Co., Inc., since 1947, was recently appointed a vice-president of Koppers, according to an announcement made by Gen. Brehon Somervell.

Mr. Keeler, who has been active in traffic affairs both nationally and in Pittsburgh, is a past president of the National Industrial Traffic League and a past president of the Pittsburgh Traffic Club. He has been connected with Koppers since 1928.

J. A. Herdlick, formerly in charge of chrome operations near Nye, Mont., has been sent to Juneau, Alaska, by the USBM, where he will be chief of its mining division for the Alaska region.

Arthur T. Dalton, secretary, Chicago Wheel & Mfg. Co., has been appointed to the Advisory Committee, Abrasive Industry of the National Production Authority in Washington, D. C.

Widely known throughout the grinding wheel and automotive industries, Dalton brings to his second Washington assignment a wealth of valuable experience. During World War II he was a member of the abrasive industry group of WPB, serving in this capacity for the duration.

Waldemar F. Dietrich, senior member of Dietrich, Morse and Associates, consulting engineers, was appointed chief of the rare and precious metals branch of the Minerals Division, Bureau of Mines, U. S. Department of the Interior.

Maurice V. Hassell has been appointed an Anthracite Institute fuel and heating consultant for the Illinois-Wisconsin territory. He has been associated with the Plumer Fuel Co. of Batavia, Ill., for the past five years.

R. L. Prain, chairman and managing director of Mufulira Copper Mines Ltd., Rhodesian's Selection Trust, Ltd., and Roan Antelope Copper Mines, Ltd., has been elected a director of the International Nickel Co. of Canada, Ltd.

George M. Walker has been appointed assistant vice-president, chemical division, Koppers Co., Inc. **Thomas J. McGinnis** succeeds Mr. Walker as manager of the company's control section. Mr. McGinnis was formerly assistant manager of the control section.

J. C. Patterson, director of sales, industrial heating, Carrier Corp., was recently reelected president of the Industrial Unit Heater Association. Others reelected were **H. S. Wheller,** vice-president and **L. O. Monroe,** secretary-treasurer.

Dr. Ivor E. Campbell has been appointed supervisor of research on chemical problems in nonferrous metallurgy at Battelle Memorial Institute. Campbell, a member of the Battelle staff since 1943, is known in the metallurgical field for his research on the preparation of metals by vapor-phase deposition.

Dr. Robert I. Jaffee has been named supervisor of research in nonferrous physical metallurgy. Dr. Jaffe will guide Battelle investigations on the properties of the less familiar metals and alloys.

—*Obituaries*—

Fred H. Johnston, 72, vice-president and director of Goodman Mfg. Co., died March 19. Mr. Johnston had been associated with the company 46 years, having been employed as cashier in 1905. In 1909 he was promoted to the office of assistant treasurer and in 1918 became secretary and treasurer. Since 1921 he had served as director of the company and vice-president since 1923. For many of these years he also served as vice-president and director of Superior Steel and Malleable Castings Co. of Benton Harbor, Mich.

Recently deceased in North Dakota is prominent businessman and politician **L. C. Stearns,** 71, of Minot. Mr. Stearns was a coal operator and the developer of the Quality Lignite Co. of Minot and other businesses.

Thomas C. Russell, 68, who retired as superintendent of the Anaconda Copper Mining Co.'s fertilizer department phosphate mines at Conda, Idaho, on January 1, 1950, died March 13 at his home in Montpelier, Idaho. He started with the Anaconda Co. in 1900 as a miner at the Diamond coal and coke operation at Diamondville, Wyo., becoming superintendent in 1920. In 1923 he became assistant manager of all ACM coal operations. From 1943 to 1946 he was in charge of the Basic Magnesium, Inc., mines at Gabbs, Nev., and in 1946 became superintendent at Conda for Anaconda.

Brent N. Rickard, 66, retired ore purchasing manager of the American Smelting and Refining Co., died at his home in Tucson, Ariz., March 8. Rickard was born at Anaconda, Mont., June 28, 1885, received his education in Denver, Colo., and at the University of Michigan. He began his professional career with AS&R in 1905 at Monterrey, Nuevo Leon, Mex., and continued his services with that company up to the time of his retirement in June 1950. During the intervening years he served at the company's smelters in Mexico, Tacoma, Wash., and Murray, Utah. From 1922 to 1925 he was assistant manager of the Utah Department at Salt Lake City, and later became manager of the East Helena Smelter in Montana. In 1928 he moved to El Paso as manager of smelters in the Southwest, then transferred to Tucson in 1939 as manager of the Ore Purchasing Department.

Throughout his long career in the Southwest, Rickard had been active in various mining organizations. He served as chairman of the Western Division and governor and director of the Arizona Chapter of The American Mining Congress. He also was a director of the American Institute of Mining and Metallurgical Engineers and chairman of the Arizona Section of the Institute.

Mine Safety Contest Planned

Plans for a nationwide three-day first-aid and mine rescue contest in the nation's capital this fall—the first one held in the United States in 20 years—were discussed and committees were named at a conference called in Washington, D. C., recently by James Boyd, director of the Bureau of Mines, it was announced by Secretary of the Interior Oscar L. Chapman.

Representatives of several state mining departments, operating companies, coal and metal mine trade associations, mine workers organizations, and the Bureau of Mines who attended the conference tentatively fixed October 3, 4 and 5 as the dates for the contest. It is expected to attract 75-80 crack trained first-aid and mine rescue teams from mines all over the country.

International and national contests of this type were held in the United States for many years up until the last one in Louisville, Ky., in 1930, when the depression of the early thirties and World War II discouraged the sponsors and participants. In many coal mining states now, district and state contests are held and the competition is keen among the various companies and teams.

In deciding upon the national capital as the site for the resumption of the national event, the conference made this selection contingent upon committee investigations of housing and other facilities. A large open space is required for the contests if the weather is good, and adequate indoor space if there is rain. Two cities —Columbus, Ohio, and St. Louis, Mo. —were chosen as alternates in case the event cannot be staged in Washington, D. C.

With J. J. Forbes, chief of the Bureau's Health and Safety Division, acting as temporary chairman, a number of working committees were also appointed. In addition to the awards to be made to the winning teams in Washington, it was thought that the opportunity to visit the nation's capital would be welcomed by the teams and their associates. Judges will be supplied from USBM personnel experienced in mine rescue and first aid training.

Concord Mine Operating

Tennessee Coal, Iron & Railroad Co., a United States Steel subsidiary, has recently put into operation its Concord mine near Hueytown, Ala., about 15 miles west of Birmingham. When at full capacity the new mine will produce 7500 tons of washed coal per day. Mining operations here are almost completely mechanized. The roofs in the haulage ways and working areas in the mine are supported with roof bolts, making the general use of timber unnecessary. Equipped with the latest devices to insure maximum coal production and quality the Concord mine has utilized the most recent developments in mine engineering underground and coal cleaning facilities above ground.

Stripping Pittsburgh Seam

In Fayette county, Pa., the Nassar Coal Co. of Star Junction, is operating the Elias strip mine and producing 1500 tpd. The property is expected to operate four years at the present rate of mining.

Announce Anthracite Conference

The 1951 Annual Anthracite Conference, ninth in the series, will be held this year at Lehigh University, Bethlehem, Pa., on May 4. The conference will cover, in one day of stream-lined sessions, the mining, marketing and utilization of anthracite and current developments in equipment.

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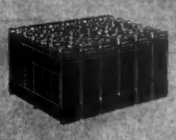

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CORRECTION

"Specifications for Roof Bolting Materials" as published in the March issue showed J. B. Dempsey as one of the committee which submitted the report. Mr. Dempsey wishes to state that he was a "minority member" and does not concur in the recommendation for rolled bolt-threads nor in the selection of A.S.T.M. 131-49T for the bolt steel.

Mine Inspectors to Meet

The Mine Inspectors' Institute of America will hold its 41st annual convention at the Phoenix Hotel, Lexington, Ky., on June 4, 5 and 6, according to Secretary C. A. McDowell of 427 Park Street, California, Pa.

Uranium as a By-Product

According to Louis Ware, president of International Minerals & Chemical Corp., a new phosphate chemical plant in Florida will be constructed. As a by-product it is planned to recover uranium.

The initial objectives in the new plant's operation will be to produce defluorinated phosphate for the animal feed manufacturing industry and multiple superphosphate for the plant food (chemical fertilizer) industry. The recovery of uranium compounds will be an additional step in these processes. It is planned to start construction on the new plant, located adjacent to International's phosphate mining property near Mulberry, in Polk County, Fla., immediately. About a year will be required to complete the plant and begin operation. After pilot plant tests over the last two years, new processes, developed by the research division of the corporation, will be employed. The completion of this plant will greatly increase the chemical production of the corporation. It is expected that the new phosphate chemical plant in Florida will produce about 100,000 tons of defluorinated phosphate annually. The first buildings to be constructed will occupy an area of about 27 acres.

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New Iron Mine in the East

About a year ago it was announced that a new discovery of iron ore had been made near Morgantown, Pa. This magnetic iron ore was found, after long prospecting, less than 30 miles from Bethlehem Steel Co.'s Cornwall mines through an airborne magnetometer survey.

A. B. Homer, president of the Bethlehem Steel Co., recently stated that the deposit which is from 1500-3000 ft below the surface will be developed through two shafts. Work on the first of these is slated to start soon. It is expected that the shafts, as well as a benefication plant, with provision for concentrating and pelletizing the ore will be completed so shipments can be started within two to three years.

Pyrite recovered in the concentrating process will be shipped to Sparrows Point, Md., where a new unit for converting its sulphur content into sulphuric acid to be used in cleaning and pickling steel will be built.

It is estimated that, when in full production, the new mine will require a daily working force of 1250 employes.

A part of the cost of the project will be subject to accelerated depreciation under a Certificate of Necessity recently issued by the Defense Production Authority.

Safety a Personal Matter

In an appeal to the 10,000 employes of the company's coal division, L. C Campbell, vice-president, Eastern Gas and Fuel Associates, pointed out that a mine accident is likely to be the fault of the man who gets hurt rather than some one else. In a personal letter to each of the 1000 supervisory personnel of the division, Mr. Campbell pointed out that safe mine practices are the personal responsibility of every supervisor and every employe.

"We cannot fail to have greater safety if each of us will make it a personal matter," he said. "Leaving it to others is the quickest way to get yourself a ride to the hospital."

Atomic Plant for Kentucky

Funds for new U-235 production units are included in the second supplemental appropriation request now being considered by Congress. The site selected for the new plant is the Kentucky Ordnance Works near Paducah, Ky. This site was chosen after careful investigation of possible locations scattered over a wide area. When completed the new plant will be operated for the AEC by the carbide and carbon chemicals division, Union Carbide and Carbon Corp., which already operates the Commission's production facilities at Oak Ridge.

This project will be under the direction of R. W. Cook of AEC's Oak Ridge operations office.

A large gaseous diffusion plant for the separation of fissionable U-235 from non-fiissionable U-238 will be the principal component of the facilities to be constructed.

The selection of the site was made in consultation with the National Security Resources Board, the Department of Defense and other government agencies and consultants.

Protect Technical Information

To implement a program of voluntary censorship among industrialists, scientists, public officials or private citizens the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., has been established to serve as a clearing house for requests for advice concerning the release of technical information. Such requests, together with manuscripts, plans, or documents, if available should be sent to the above address.

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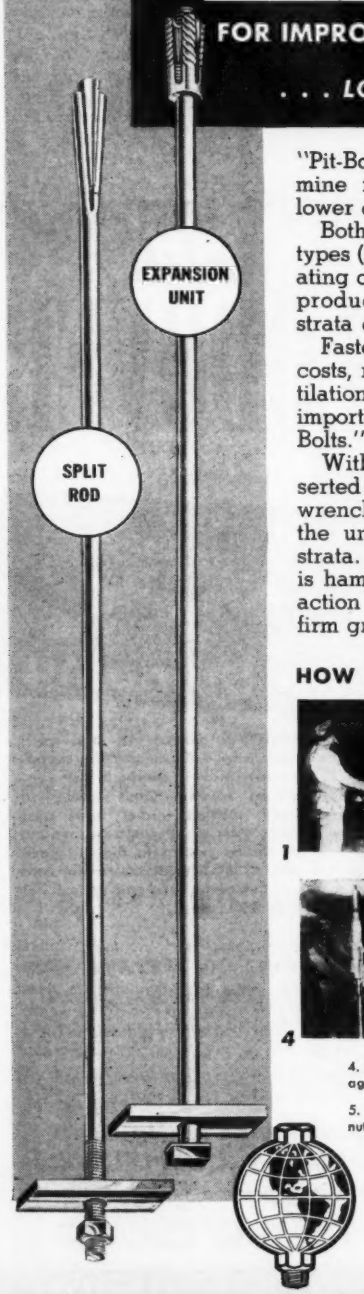

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Both Expansion Unit and Split Rod types (illustrated left) are reducing operating costs and establishing outstanding production records everywhere roof strata conditions permit their use.

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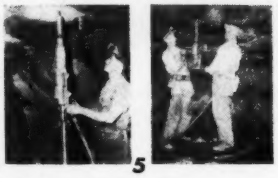

1. Hole is drilled to approximately the length of the rod.

2. Expansion Unit is inserted with plate in position.

3. Bolt tightened with air or motor-driven wrench.

4. In Split Rod type an air-driven hammer drives wedge against top of the hole, forcing split ends into rock strata.

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cies expert in the particular field, assemble the comments and forward the Government's advice together with any original materials submitted by the inquirers. Under no circumstances is a person who requests guidance required to follow the Government's advice regarding disclosure of unclassified information.

Each individual is presumed to be the final judge of how best to serve the public interest.

All inquiries will be answered as promptly as the limitations imposed by problems of fact and judgment will permit.

Up Steel Production Through Coal Cleaning

Completion of another step in the expansion program of Inland Steel Co. was disclosed recently with the announcement that the company has placed in operation a coal preparation plant at its East Kentucky mines capable of processing 750 tons of raw coal an hour.

Mechanical removal of slate, stone, and other impurities in the new plant will reduce the ash 50 percent in coke made from the coal, and increase its "fixed" carbon, the essential element for blast furnace use, Philip D. Block, vice-president in charge of raw materials, said.

Hjalman W. Johnson, vice-president in charge of steel making, said the lower ash coke will enable production of 200 tons more pig iron daily with present equipment and that this additional molten iron will speed production of steel by cutting heat time in open hearth furnaces where the pig iron is used in the making of steel.

Ash, Johnson said, is a burden to transportation and processing at all stages in steel making. It has been more of a problem for mills, he said, since machine loaders replaced manual mining which permitted handpicking of foreign material from the coal.

Waste from the blast furnaces, or slag, will be decreased 10 percent, Johnson said, cutting the fuel required to produce molten iron. Other important benefits result, he said, from the fact that less limestone will be used in blast furnaces to counteract acid formed by the ash.

Coal chemicals important to production of fertilizer, plastics, varnishes, lacquers, and other items will result from the use of lower ash coal in the coke ovens, Johnson said.

He estimated that daily production from Inland coke ovens using the low-ash coal will be increased as follows: ammonium sulphate, 10 percent; coal tar, 5 percent; light oil, the basis of benzol, toluol, xylol, 5 percent. In addition, he said, 2 percent more coke over gas will be recovered for fuel use.

The new preparation plant is located near the center of remaining

reserves of Inland's Wheelwright and Price mines in the Elkhorn No. 3 seam in Floyd County, Kentucky, Block said. It is eight miles from the company's coal mining village at Wheelwright. He said the company plans to process at the plant all of the high volatile coal it uses in the manufacture of steel.

A 4½-mile tunnel was dug to connect the Wheelwright mine with the Price mine and the preparation plant, Block explained.

The tipple of the Wheelwright mine, first all-steel surface structure in the Kentucky fields when erected in 1932, is to be removed together with the railroad tracks serving it. The site will be used for a public playground in the heart of Wheelwright, considered the model coal mining community of the United States.

The steel and concrete preparation plant designed and built by Link Belt Co. is in a valley. Coal from a mountainside mine portal is carried downhill by conveyor from a rotary dump which unloads two mine cars at each operation. Rock and refuse from the mine and that discharged from the cleaning plant is conveyed up the opposite mountainside for disposal.

The plant sorts, crushes, washes, blends and loads the coal into railroad cars. Water used in the plant is clarified and recirculated.

With the plant in operation, Block said, "total seam" mining can be used permitting recovery of coal in fault areas of the property which could not previously be mined at favorable costs.

Chemicals from Synthetic Fuel Plants

At the 1950 annual meeting of the ASME, James Boyd, director, U. S. Bureau of Mines, stated that synthetic fuel processes can play an important part in meeting requirements for strategic chemicals used in the manufacture of such essential products as synthetic rubber, plastics and nylon. Benzene, phenol, toluene and certain other chemicals could be produced under accelerated schedules to meet increasing requirements for these vital materials. Coal-hydrogenation plants could be operated to increase yields of benzene, toluene and xylenes.

In his remarks, Mr. Boyd stated "The trend in technology is toward expanding the area of interfuel competition, either by introducing new devices for utilization or by increasing knowledge of converting the various fuels into forms usable in present-day equipment. An example of the developing technology of the former type is the gas-turbine locomotive burning powdered coal. The synthetic fuels illustrate the latter."

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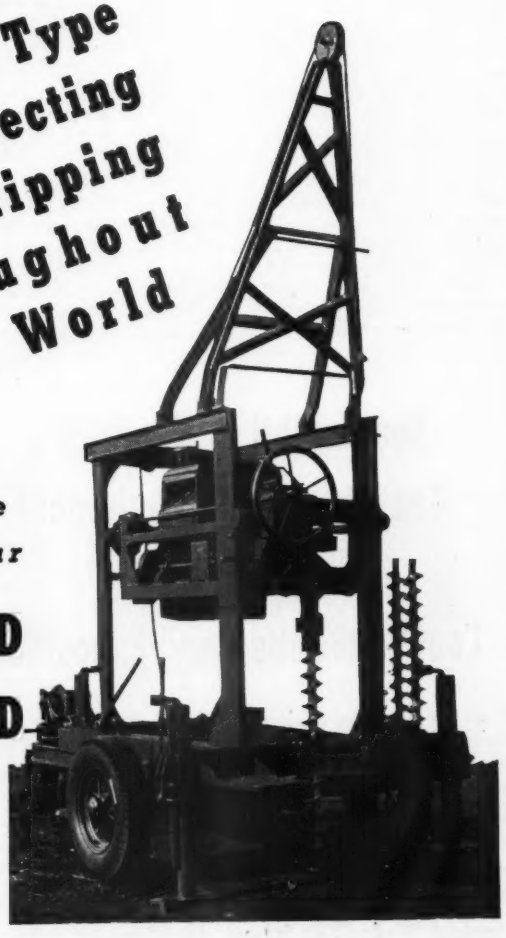

The Parmanco Two-Speed Transmission Drill is designed to meet the requirements of the general prospecting field where it is not necessary to drill in solid limestone. Special sliding frame permits drilling and pulling of augers without moving drill. New design of chuck eliminates all hand operation in raising power plant. Recommended for 50 to 60 feet with four and one-quarter inch equipment. Under favorable conditions it is being used to greater depths and can be used with six inch equipment.

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BCR Plans Campaign

Preliminary steps were taken for the coal industry to evaluate its research, engineering, educational, and promotional activities as a result of action taken by member companies of Bituminous Coal Research, Inc., during the annual meeting of the national research organization held in Columbus, Ohio, on March 7.

In order to formulate a program that will satisfy the needs of coal consumers and increase markets for coal, the members of Bituminous Coal Research, Inc., officially requested its president, Dr. A. A. Potter, to appoint a committee of top-level coal executives of the nation to: (1) evaluate the research, engineering, and promotional needs of the industry as soon as possible, (2) recommend an effective program for accelerated industry progress, and (3) obtain industry consideration of the plan at an early date. The committee to be appointed will contain executives representing Bituminous Coal Research, Inc., National Coal Association, and coal companies who are not currently members of the research agency.

During the same meeting three coal executives were elected to the board of directors of Bituminous Coal Research, Inc. The new directors who will assist in the coal industry's research program to develop new methods and equipment for the production and utilization of coal are: Joseph Pursglove, Jr., vice-president, research and development, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa.; David Roberts, III, general manager, Brilliant Coal Co., Birmingham, Ala., and R. B. Williamson, vice-president, Eastern Coal Sales Corp., Bluefield, W. Va.

Speaking of Safety

A new series of six training films showing supervisors and foremen how to address and conduct meetings has just been announced by the National Safety Council.

The series was prepared under the guidance of Dr. Irving J. Lee, of the School of Speech, Northwestern University, Evanston, Ill.

Film No. 1 in the series is "The Power of Speech." It lists occasions when foremen and supervisors may be called on to make a speech and explains the difference between a formal and a working speech. It also discusses the purpose of a speech from the audience and speaker standpoints.

Film No. 2, "Butterflies in Your Stomach," explains physiological reactions that cause stagefright and shows how to overcome them.

Film No. 3, "The Key to Good Speaking," outlines four methods of preparing a speech and gives the recommended method. It also shows, step by step, how to prepare a typical safety speech using the recommended method.

Film No. 4, "On Your Feet," explains what to do physically when making a talk. It shows how to stand, the purpose of moving around and how to do it effectively, what to do with your hands, and where to look.

Film No. 5, "Now You're Talking," discusses actual speech-making. It covers vocabulary and phrasing of ideas, how loudly to talk, and the speaker's attitude. It also shows how friendliness, sincerity and enthusiasm can make a speech a success.

Film No. 6, "Ring the Bell," shows how to get and hold the attention of an audience, and how to illustrate a point by telling a personal experience, a humorous story or by comparisons. It also shows how to "break the ice," and explains the value of demonstrations, scale models or mock-ups, films, still pictures, graphs, charts and diagrams.

See Exhibit of Hendrick's Coal Production Equipment BOOTH 830 Coal Convention and Exposition

Working with the coal industry for over seventy years, Hendrick has developed a wide line of production-speeding equipment that includes Flanged-Lip Screens, Wedge-Slot Screens, Perforated Metal Plate for Vibrating and Shaking Screens, Elevator Buckets, Flights, Shaker Conveyor Troughs and Ball Frames.

Hendrick Flanged-Lip Screens are made with short, medium or long slots in 148 standard slot sizes.

Hendrick Wedge-Slot Screens are unequaled for a wide range of screening and dewatering operations. These continuous slot screens are available with profile bars of different types to suit specific applications.

Hendrick Perforated Plate for vibrating and shaking screens can be furnished, flat or corrugated, with any desired shape and size of perforation, in proper gauges of tank, high carbon, high tensile, and abrasion-resisting steels, and in other commercially rolled metals.

Hendrick Elevator Buckets are made to specifications in any desired size, shape and capacity; plain or perforated; welded or riveted.

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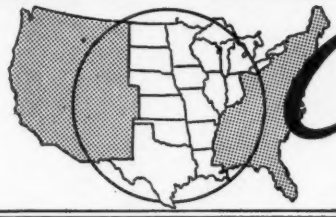

Central States

Buy Coal Lands

Stuyvesant Peabody, Jr., president of Peabody Coal Co., Chicago, Ill., announced the acquisition by Peabody Coal Co. from the Zeigler Coal & Coke Co. of approximately 12,000 acres of coal and other mineral rights in Christian County, Illinois, and the acquisition of 12,000 additional acres of coal and other mineral rights in Bond County, Illinois.

Peabody stated that the property acquired from the Zeigler Coal & Coke Co. adjoins other properties presently owned by Peabody Coal Co. in Christian and Bond Counties and will facilitate Peabody's mining operations in the future.

Acquire Strip Mines

Sinclair Coal Co. of Kansas City, Mo., has recently acquired the Northern Illinois Coal Corp., which operates an important group of strip mines in Wilmington, Will and Grundy Counties, Ill. The combined daily capacity of these mines is 6500 tons.

New Sulphur Mine

As an outgrowth of an active exploration program for new reserves of sulphur, the Freeport Sulphur Co., operators of Louisiana's only sulphur mine located at Grand Ecaille near Port Sulphur in Plaquemines Parish, will construct a multi-million dollar sulphur mining plant at Bay Ste. Elaine Dome in Terrebonne Parish, La.

Work on the plant will start at once and is expected to be completed in two years.

Because half the dome is under water and the remainder consists of unstable marshland, the entire plant will be built 75 miles away, floated to the site on barges and then sunk into place.

According to Edmund D. Wingfield, vice-president of the company, the amount of sulphur that will be produced at Bay Ste. Elaine depends on the nature of the underground formations and cannot definitely be determined now. Mined sulphur will be barged in liquid form to Port Sulphur for storage.

In addition to the Bay Ste. Elaine Dome, Freeport Sulphur Co. will prospect for sulphur at four other Louisiana marsh domes—Garand Island Bay and Venice in Plaquemines Parish, Lake Pelto and Dog Lake in Terrebonne Parish. All of these domes are in exposed coastal marshes.

Along with the work by the Freeport Sulphur Co., another company, the Jefferson Lake Sulphur Co., is going ahead with plans for the Stark Dome near Lake Charles in Louisiana.

Push Taconite Research

United States Steel Co., plans to push its research into utilization of the nation's low-grade iron ore reserves, including Minnesota taconite, "even more vigorously" than in the past. This announcement was made by Benjamin F. Fairless, president of the company, who said the company has created a research policy committee as a means of placing emphasis upon research in the mining, manufacturing and distributing subsidiaries of U. S. Steel. Dr. R. E. Zimmerman, vice-president and director of U. S. Steel, has been named chairman of the committee. Other members are C. F. Hood, D. F. Austin, R. M. Blough, M. W. Reed, G. W. Rooney, all executive vice-presidents of the company and H. B. Jordan, president, American Steel and Wire Co.; Alden G. Roach, president, Columbia Steel Co.; Walter Mathesius, president, Geneva Steel Co.; J. E. Goble, president, National Tube Co.; A. V. Wiebel, president, Tennessee Coal, Iron and Railroad Co., and Dr. E. C. Bain. Secretary will be Dr. J. B. Austin, director of research, U. S. Steel.

In discussing both long range and immediate objectives of the research policy committee, Fairless said Dr. Zimmerman emphasized particularly the increasing need for research brought about by the national emergency, scarcity of various alloy metals, and the growing complexity of military requirements. New and special types of steel, properly processed, are needed for the most modern types of military equipment, Fairless said.

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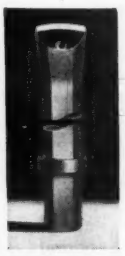
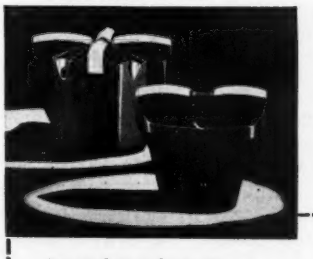


Crown-carbide Rok-Bit ▼



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JOHN L. COLLYER
President, The B. F. Goodrich Company

"I want to see Americans save for their own personal security, and I want to see them, as stockholders in our government, urge economy in all phases of our national life in order to provide national security against aggression."

By their rapidly mounting participation in the Payroll Savings Plan, Americans *are* saving for their personal security, fighting the menace of inflation and making a major contribution to America's defense against aggression. In Mr. Collyer's own company 80% of the 38,000 employees throughout the company have already enrolled in the Plan, with two large divisions still to report.

As Chairman of the Ohio Payroll Savings Advisory Committee, Mr. Collyer knows what is being accomplished by leaders of industry, top management and labor in their joint effort to step up the Payroll Savings Plan. A few recent figures should be interesting to those not so familiar with the national picture:

• In the steel industry campaign, Carnegie-Illinois Steel Corporation (now U. S. Steel Company), recently raised its payroll participation from 18% of 100,000 employees to 77% . . . Columbia Steel Company of California went from 7.9% to 85.2% . . . American Bridge Company signed 92.8% of the workers in the large Ambridge plant . . . 87% of Allegheny-Ludlum Steel Corporation's 14,000 employees are now on the Payroll Savings Plan . . . Crucible Steel Company of America, reinstating its plan, signed up 65% of its 14,500 employees.

• In the aviation industry, Hughes Aircraft Company went from 36% to 76%; Boeing Aircraft enrolled 10,000 new names before Christmas.

Some dollars and cents figures? In the last quarter of 1950, sales of $25 E Bonds—the denomination so popular with payroll savers—increased 2.5% by 245,000 bonds more—over the last quarter of 1949.

If you do not have The Plan That Protects the personal security of your employees, the national economy and our country's defense, phone, write or wire to U. S. Treasury Department, Savings Bonds Division, Washington Building, Washington, D. C. Your State Director is ready to help you install a Payroll Savings Plan or step-up your employee participation.

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Retiring President Donald H. McLaughlin presents the Robert H. Richards award to Frank R. Milliken, assistant manager, Titanium division, National Lead Co.; the Charles F. Rand medal to James D. Francis, chairman, Board of Directors, Island Creek Coal Co.; and the William Lawrence Sanders medal to Clyde E. Weed, vice-president, Anaconda Copper Mining Co., at the annual banquet of AIME, Hotel Jefferson, St. Louis, Mo., February 21

AIME Annual Meeting in St. Louis

More Than 2000 Attend Five-day Convention

ON February 18-22 the St. Louis section of AIME and the whole city of St. Louis played host to 2500 members of the American Institute of Mining and Metallurgical Engineers on the occasion of the Institute's annual meeting. At the Welcoming Luncheon on Monday, Arthur H. Compton, Chancellor of Washington University, made the principal address. In it he pointed out that in time the Russians will be as ready to wage atomic warfare as we; and no nation will be willing to suffer the havoc such a two-way war would wreak. It was his conclusion that there would be no global war for many years to come.

Nevertheless, military plans and the threat of Russian aggression were the principal theme of many of the sessions. A sidelight on this subject was brought out by Dean S. C. Hollister of Cornell University, who is an authority on the manpower question. He emphasized the fact that by 1952 there will be a shortage of 40,000 engineers in this country. This shortage is due to virtual cessation of engineering training during the war years. While we practically shut down our engineering schools, we were the only country to do so. The Russians, for example, even when hardest pressed, managed to turn out 150,000 engineers trained to the equivalent of a master of science degree and in addition trained 300,000 technicians. Dean Hollister estimated that a freshman class of 30,000-40,000 in engineering schools each year will barely meet future military and industrial needs for men with engineering training. On the other side of the ledger, Paul M. Tyler in an address before the Mineral Economics Division stressed the point that even though Russia's mineral resources are great she lacks the industrial capacity to wage a long war. Output per worker is lower and so many are needed on farms that relatively few are available for industry and mining.

The Howe Memorial Lecture was delivered by Joseph R. Vilella, research laboratory, United States Steel Co. He spoke of the advances in metallography made during the last 25 years. According to Vilella, these gains have highlighted our understanding of steel enabling us to see the true configurations of steel structure.

Space does not permit reporting fully on the numerous papers delivered in more than 80 technical sessions to attentive listeners.

All of the time not taken up by more serious events was devoted to several entertainment functions and dinners. The Dinner-Smoker on Monday night was well attended as usual and the entertainment committee deserves many thanks for the fine show. On Tuesday night the informal dance was all that an informal dance should be with a square dancing exhibition by the famed Normandy High School group. On Wednesday morning a "Scotch Breakfast" specialty of the Minerals Beneficiation Division was enjoyed by many.

The annual banquet in the Hotel Jefferson's Gold Room featured the awarding of prizes, medals and citations to many leaders of the mineral industry. Presentations were made by Donald H. McLaughlin, retiring president of the Institute.

Among these were the William Lawrence Saunders medal to Clyde E.

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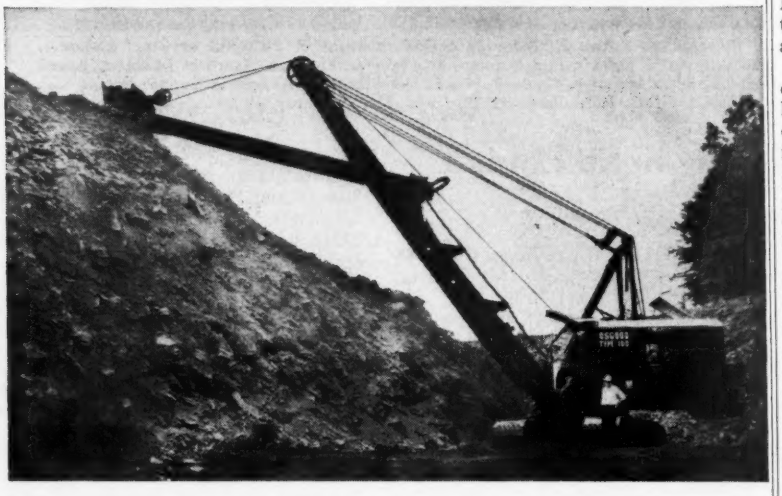

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Literature of interest to strip miners will be available on both Osgood and General Excavator Machines.

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Weed, Anaconda Copper Mining Co.; the Charles F. Rand Medal to James D. Francis, Island Creek Coal Co.; the Robert H. Richards award to Frank R. Milliken, National Lead Co.; the Erskine Ramsay Medal to James B. Morrow, Pittsburgh Consolidation Coal Co.; the Mathewson Gold Medal to Charles S. Barrett, Emeritus Professor of Metallurgy and Metallography at Yale; the Robert W. Hunt award was shared by Richard R. Webster and Harold J. Clark, both of Jones & Laughlin Steel Co.; the J. E. Johnson, Jr. award went to Samuel Naismith of Oliver Iron Mining Co.; the Rossiter W. Raymond memorial award was won by Amos J. Shaler.

Zay Jeffries, retired vice-president of General Electric Co., was made an honorary member of AIME and 25 distinguished members were inducted into the Legion of Honor. Of these 50-year members, Herbert R. Hanley, Horace Moses, J. V. N. Dorr, James F. Brophy and Lewis E. Young were present at the banquet.

After the awards were made Dr. McLaughlin turned the meeting over to his successor, W. McG. Peirce who, after a fine speech of acceptance, adjourned that portion of the program. Immediately following the banquet the president's reception was held in the Crystal Room with Mr. and Mrs. Peirce, Dr. and Mrs. McLaughlin and Mr. and Mrs. Howard I. Young sharing honors of the reception line. The banquet and reception were followed by a dance which was fully enjoyed by all.

On Thursday, Friday and Saturday there were field trips to mines, mills and smelters of leading lead-zinc producers of Southeast Missouri and the Tri-State district as well as trips to coal properties and the USBM synthetic oil plant at Louisiana, Mo.

To Name Lab For Senator

Because Charles Robertson, former North Dakota congressman who passed away suddenly in February, was instrumental in obtaining the lignite laboratory at Grand Forks, N. D., for the state, Sen. Langer has introduced a bill into Congress to name this laboratory the "Charles R. Robertson Laboratory."

To Boost Lead-Zinc Output

Calumet & Hecla Consolidated Copper Co.'s new lead-zinc mine at Shullsburg, Wis., is currently producing about 650 tons of ore daily it was recently reported by President Endicott R. Lovell. Mine output is expected to increase to about 1200 tons of ore a day by midyear an annual rate of 15,000-18,000 tons of metallic zinc. Development of the Shullsburg mine started in 1948 and production was begun January 1, 1951.

May Reopen Iron Mine

An Ironwood, Mich., delegation to Washington will try to develop data requested by the government on a project for reopening of the North Norrie, an abandoned iron mine near Ironwood. Defense Minerals Administration officials expressed interest in the mine, but said a specific proposal would be necessary before any federal-aid decision could be made. The delegation was first told to find an operator for the mine, then make sure he had leases on the property, and finally have him submit a request for a loan or grant with all of the pertinent engineering data.

Robert Byers, chief industrial agent for the Michigan Department of Economic Development, who accompanied the Ironwood group to Washington, said he believes there will be no trouble in finding an operator. The mine has been abandoned for 15 years, and is within the Ironwood city limits. It is said to be able to produce high-quality ore for another 20 years.

Plan Manganese Project

The Manganese Chemical Corp. of Minneapolis, Minn., with the Metalloy Corp., and its parent organization, the Lithium Corp. of America, recently opened negotiations with the Iron Range Resources and Rehabilitation Commission of Minnesota to gain use of an iron powder experimental plant near Aurora, Minn., to be used by these firms in the production of manganese from manganiferous iron ores of the Cuyuna range.

K. M. Leute, president of Manganese Chemical Corp., told the commission the company now has developed a method after several years of laboratory and pilot plant work, for extracting manganese from the ores. It is believed commercial operations could be developed to supply a substantial part of the manganese for specialty uses in this country. Eventually, according to Leute, this would result in large scale operations for producing manganese from Minnesota's reserves at a sufficiently low cost to take the place of cheaper forms of manganese now being supplied almost entirely from foreign sources.

Safety by Mail

Instead of big posters or pep talks, John E. Jones, West Frankfort, Ill., safety engineer for the Old Ben Coal Corp. in Illinois, gets over his safety ideas via post cards to Old Ben miners.

Jones, on the printed post cards, may talk about anything from the weather to women drivers, but he gets over his points concerning safety in a pleasant amusing fashion.

He has been using these "post card pep talks" for about a year.

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Wheels of Government

(*Continued from page* 123)

the minerals supply program and determine "fairly and accurately the increased production that must be expanded at home." He also described the numerous other agencies involved in the minerals program picture and said: "There is an inevitable and unavoidable delay in the execution of our programs, because of necessary review by the approving authorities; I can only say that such review is imperative to evaluate the effect of DMA's proposals on all other programs and policies. There is no use expanding mineral supplies if by doing so we preempt facilities, manpower, or equipment required to convert them into usable products, or create serious inflationary pressures."

Rep. Engle asked Boyd if the equivalent of the former Premium Price Plan could be put in operation by an order under the Defense Production Act. To this Boyd answered that it could be done but that both small and large producers had expressed opposition to subsidies. He said he felt a better method of approach is the selective contract system carrying a Government-guaranteed price for a definite period of time. Boyd reminded the subcommittee that two years were required to put the Premium Price Plan into full operation.

Sam M. Ewing of the Metals Branch and Sam Lipkowitz, an economist, represented the Office of Price Stabilization, testifying that delay in issuance of special price regulations has been due to lack of personnel. Answering questions by members of the subcommittee, Ewing stated he would favor a subsidy for mines if ceiling price levels can be maintained. Edwin T. Gibson, deputy Defense Production Administration representative told the committee his office has to approve programs worked out by Defense Minerals Administration, although he indicated there have been delays pending study of specific minerals expansion programs. The Director of Program and Requirements for the Defense Production Administration, C. E. Wampler, explained that his agency appraises supply-demand balances and keeps all defense agencies posted as to the requirement of the military and civilian economy and the projected supplies available. In reply to questioning Wampler stated that mining equipment manufacturers will get priorities on steel beginning in June and that DMA will handle this program.

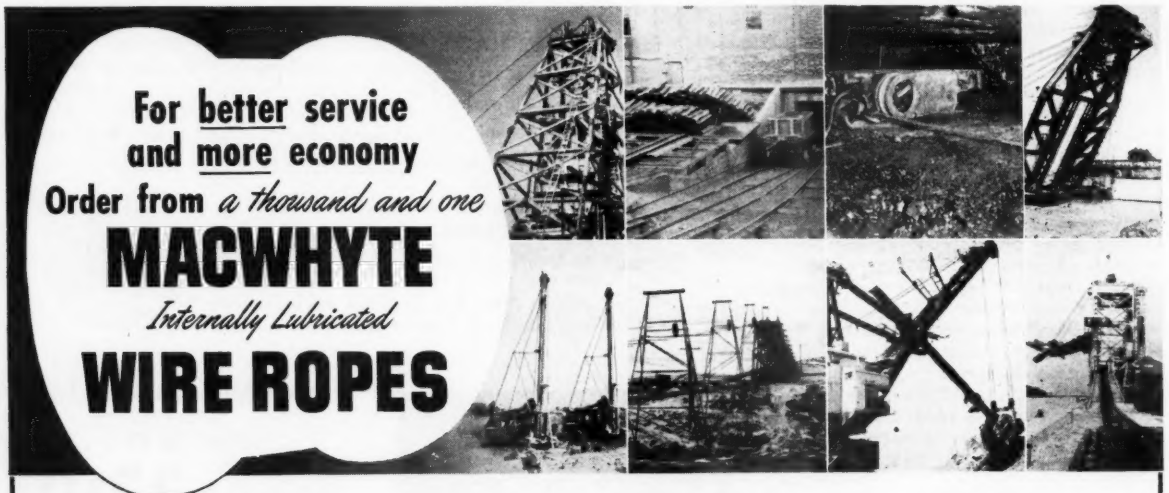
BOOK REVIEW

MINERAL INDUSTRIES EDUCATION. *By Edward Steidle, E.M., D.Sc. Dean, School of Mineral Industries, The Pennsylvania State College. Published by Pennsylvania State College, 1950, 252 pages, 6 by 9.*

A SERIES of circulars written over an extended period has been compiled and added to in the preparation of this well written, comprehensive history of mining and man's dependence on it not only for creature comforts, but also for the very survival of civilization and himself.

Dean Steidle has drawn on his accumulated knowledge and experience to stress the importance of conservation of our mineral resources and offers well-considered, constructive suggestions for much-needed individual and governmental action, to aid in conserving our mineral wealth and training those to whom this heritage will pass.

He presents a blueprint of what he considers a proper education to insure able representation in government and capable management for the second greatest industry of this country and the primary source of the wealth and power of the nation.—M. J. F.



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997

Western States

Complete First Mill Run

Nabob Mining Co., Wardner, Idaho, on Pine Creek, has made its first mill run on lead-zinc development ore from the Crystolite vein. The vein is a wide mineralized structure in Prichard quartzite and the ore bearing portion has developed widths of 17 ft of good milling ore. The company developed this ore structure for several hundred feet in length and for 90 ft above the tunnel level. Nabob's deep tunnel was primarily started to open the Nabob zinc-lead vein upper levels of which are still operated by leasers.

Montana Atom-Ore Shipped

On the last day of February Montana's first railroad car of commercial uranium ore left Boulder, Montana, according to President Wade V. Lewis of the Elkhorn Mining Co. He thought it might also be the first in the Pacific Northwest. The ore originated in Elkhorn's Free Enterprise Mine near Helena. Lewis believes that the Free Enterprise Mine is unique in the nation for mining from a vein 150 ft underground, in an area once combed over by gold prospectors. This mine has been under development for a year and a half.

Keystone Mine Shut Down

Excessive costs of labor and supplies are given as the cause of suspension of operations at the Keystone mine and the Dayton mill in Silver City, Nev., area by Dayton Consolidated Mines, the Comstock Lode's last producer of gold-silver ore. Some profitable ore is exposed in the mine, but not enough to keep the mill operating at capacity.

Experimental Manganese Mine

At Artillery Peak, in western Arizona, the United States Bureau of Mines has driven more than 1400 ft of adits, or access and haulage tunnels, in preparation for experimental mining operations to develop a low-cost method of extracting the manganese ore. Core drilling also is planned to determine more exactly the size and grade of the deposit, estimated at 50,000,000 tons of sub-marginal manganese ore. Ore from the deposit will be trucked to Boulder City, Nev., where the bureau is erecting a $600,000 pilot plant to demonstrate processes for treating this and other low-grade ores from domestic manganese deposits.

Dead Medicine Mine Revived

Now owned by Silver Trail Mining Co., the Dead Medicine mine east of Bossburg, Wash., one of the oldest mines in the northwest, is again shipping ore. The property has been leased since mid-1949 to Robert Ramser of Spokane and A. B. Sylvester of Evans, Wash. The zinc-lead-silver ore is treated at the Young America mill at Bossburg. The concentrates are shipped to the Bunker Hill smelter at Kellogg, Idaho. The Ramser-Sylvester syndicate built ore bunkers, installed new machinery and drove 100 feet of new tunnel. Shipments include both new ore and dump material.

To Increase Production

Gold mining on a broader scale is scheduled by Sarita Milling Co., at its properties in the Masonic district, Calif. Capacity of the mill and power plant will be increased and mine operations accelerated. The company is reported milling 100 tons of gold ore daily from the Chemung, Pittsburg-Liberty, Sarita and other properties.

Alaska Uranium Prize

A special $10,000 bonus has been approved by the Alaska Legislature for the discovery of radioactive minerals in the Territory. The bonus is in addition to the recently increased AEC award and will be made under same terms as the latter.

Since three areas of radioactivity in the Territory were reported in 1950 a strong possibility exists that there will be a claimant for the prize among the prospectors expected to be attracted to Alaska by this news. In addition to intensifying the search for fissionable material it is hoped that the lure of this bonus will result in discovery of many more sources of other strategic and critical minerals.

Additional information may be obtained from the Alaska Development Board, Box 50, Juneau, Alaska.

Cumberland Mine Shut Down

The Cumberland mine above Castle, Mont. has been closed down. Superintendent J. C. MacLean stated there was not enough ore in sight to justify further operations. The Cumberland was considered to have the largest silver and lead ore bodies in Montana at one time. At the 500-ft level the mineral body was 70 ft wide, and assayed 50 oz in silver and 45 percent lead. Attempts to locate new ore have been made during the past year but the search indicated no further ore.

Eureka Drills Property

Eureka Corp., Ltd., announced recently that it is seeking government help toward developing a zinc-lead ore body at Eureka, Nev., where exploratory drilling was started last August 1. Since then approximately 4300 ft of rotary drill holes have been made from the surface and 750 ft of diamond drilling underground. The surface drilling, the company says, has disclosed some zinc-lead mineralization, but insufficient information is available to draw conclusions. The diamond drill holes underground have not yet reached the favorable area. Both drilling projects are being continued.

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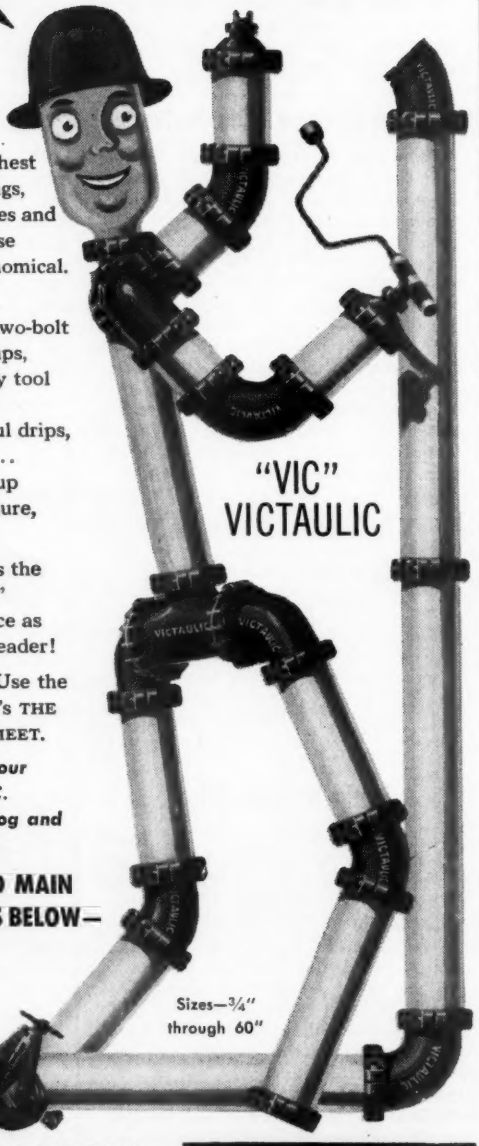

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You save every way when you JOIN UP with "Vic"— a simple two-bolt design gives quick, easy hook-ups, a speed or T-wrench is the only tool needed for connections... AND Victaulic joints prevent wasteful drips, costly blow-offs and pull-outs... stay positive-locked, buttoned-up tight even under extreme pressure, vacuum or strain conditions.

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Montana Kaolin

Caledonia Mining Co. of Wardner, has acquired control of a kaolin clay deposit near Lewistown, Mont. The deposit is said to cover about 20 acres and is from five to 30-ft in thickness. The discovery has been examined by the USBM whose report states that the clay is a high grade kaolin known as "dickite" and is one of the few deposits of this type of clay found in the United States. Prices for the processed clay range between $12.50 and $55 per ton, depending on grade.

Stockpiling Ore

Silver Dollar Mining Co. of Spokane, Wash., is stockpiling silver-copper ore from a new strike on the 1800-ft level. The ore comes from a crosscut driven to prospect the Yankee Girl shear zone between the Sunshine and Silver Summit mines near Wallace, Idaho. Where first encountered, the vein showed only well mineralized vein filling but in drifting west towards Sunshine has developed an 18-in. width of the silver-copper ore.

Mohawk Shaft Development Work

Ore containing gold, lead and vanadium is under development at the Mohawk mine operated by E. T. Dorsett, David Stonebracker and Andrew Willis in the Lonesome Hill sector of the Goldpoint district of Nevada. The vein, four ft wide, is said to average about $35 in gold per ton, carries profitable amounts of shipping grade lead and shows some vanadium claimed to be radioactive. The partners have extended a tunnel on the vein and installed essential mining equipment. Several ore shipments have been made to the Steteline mill near Goldpoint.

Reopen Copper Mines

Plans for mining a large deposit of low-grade copper ore in the Catalina Mountains has been announced by officials of the newly organized Arizona Copper Mines, Inc., of which J. E. Moewinckle, oil producer of San Antonio, Texas., is president.

The mining property, located in the Old Hat mining district 20 miles north of Tucson, Ariz., is expected to develop into an extensive operation, according to Moewinckle. The several properties controlled by the company were formerly known as the Control mines, the Daily Arizona Mining Co., the Stratton Mining Co. and the Hartmann claims.

The total ore body, believed to contain about 100,000,000 tons of low-grade ore, comprises 52 patented claims and 30 unpatented claims. From 1936 to 1946 the properties operated but were shut down following the war.

Lithium Ore Shipped

A second five-ton shipment of lithium-bearing ore has been made to the Corning Glass Works at Corning, N. Y., from claims that B. H. Fortner and Bert Boyd are developing south of Wickenburg, Ariz. Several other chemical concerns have shown interest in this lithium discovery. The element is used in lithium rods used in the atomic pile that produces tritium.

Fire in Smuggler Mine

Fire trapped six men in the Smuggler mine at Silver Plume, Colo., but they all scrambled out on a rope after being imprisoned for three hours. None were hurt. Flames razed the shaft house and hoist of the mine and for some time the heat prevented anyone approaching the shaft. When it had cooled, a rope was lowered to the men. The Smuggler is an old mine, owned by the Mile High Mining Co. and operated by C. P. Schreiner.

Ore from Vulcan Shaft

Some development ore from AS&R's deep Vulcan shaft on Lake Gulch near Wallace, Idaho, has been processed at the old 150-ton Galena mill near the shaft collar. New development on the 3000-ft level has lately been confined largely to diamond drill work. Results of this work have not been released officially, but it is reported that drill cores show continuation of the orebodies encountered in the crosscut from the bottom of the shaft.

To Revive Chrome Mining

Fay Bristol, president, Oregon Mining Association, at Grants Pass, Ore., has recently received word that the federal government is taking renewed and enthusiastic interest in the redevelopment of chrome mining in Josephine County, Ore., at a standstill since World War II. More than a $1,000,000 worth of chrome was shipped each year from Grants Pass during the war.

Kennecott in Ingersoll Canyon

Operations have been started on an extensive copper deposit in Ingersoll Canyon, between Lane City and Ruth, Nev., by the Kennecott Copper Corp. The property covering more than 50 acres, is estimated to contain about 3,500,000 tons of copper ore, and was purchased recently by Kennecott from Ely Hidden Treasure Co. Kennecott engineers estimate about two years for development work before production begins.

Ore bodies will be worked in an open pit and operations are expected to be on a full scale with powerful machinery early next spring. Nevada's largest copper producer, Kennecott is working its properties at Copper Flat and Ruth on a capacity basis and reported producing 20,000 tons of ore daily.

To Seek Uranium

Little May Mining Co. has acquired under bond and lease one-half interest in the Blackie group of mining claims, Marysvale, Utah, to prospect for uranium ore, directors of the company learned at their annual meeting. Developments in Box Elder, Beaver and Juab Counties also were discussed.

Sarita Expands Plant

Power and milling facilities have been enlarged by the Sarita Milling Co. at its gold properties in the Masonic district near Bridgeport, Calif., in preparation for increased ore production. A power shovel is stripping waste from an ore deposit at the Sarita mine, reported to be 100 by 200 ft. This deposit apparently persists to a depth exceeding 200 ft and shows some high grade ore and milling quartz. The company has operated a milling plant of 100 tons daily capacity for several months at the Sarita property.

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Install Asbestos Mill

The Huntley Industrial Minerals, Inc. has completed installation of its second mill at Laws, Inyo county, Calif. The new unit is similar to the first, a five-roller Raymond mill, in which non-metallic minerals such as asbestos, clay, pyrophyllite, and feldspar are ground for use in fillers, insecticides and other industrial purposes. Installation of two Raymond impact mills is also planned at an early date. This organization has started production of asbestos from its deposit near Tin mountain. The rock as mined, is white, iron-free tremolite intermixed with calcite. It is ground to 100 mesh size for sale to the building trades.

Dedicate New Carlton Mill

On March 12, Lowell Thomas, world-renowned newscaster and commentator and a former resident of Victor, Colo., formally dedicated the new Carlton Mill of the Golden Cycle Corp. at Elkton, Cripple Creek District, Colo. The ceremonies were broadcast over the facilities of CBS.

This fine modern mill is successor to the Golden Cycle Mill at Colorado Springs through which passed for treatment 40,000,000 tons of ore from the Cripple Creek district. The story of the design of the new mill, selection of equipment and construction of the new building was ably presented in the November 1950 MINING CONGRESS JOURNAL by Max W. Bowen, director of the Golden Cycle Corp. and vice-president in charge of milling.

The Carlton mill, as was the Golden Cycle before it, will be operated strictly as a custom mill; that is, all ore treated will be purchased from the shipper whether it be from Golden Cycle controlled properties or from independent shippers.

The Golden Cycle Corp., Merrill E. Shoup, president; Max W. Bowen, vice-president, and the citizens of Cripple Creek district deserve the thanks and compliments of the entire nation for this far-sighted development designed to continue in the fine tradition of Colorado mining to create employment opportunities and contribute to the general wealth.

War Eagle Mill

Remodeling of the War Eagle mill is progressing at Manhattan, Nev. Operation of the plant on custom ore is expected to accelerate leasing activity and reopening of some small gold properties in the Manhattan district and adjacent areas. Present tonnage capacity of the mill will be retained, but the process will be changed from amalgamation and concentration to straight cyanidation.

Designed for treatment of 100 tons daily, the plant was built in 1908 by the late Matt Keane, and operated on gold ore from Manhattan mines for many years. An electric power line was recently completed to the mill, which is expected to be ready in the near future. The plant is now owned by Mark Bradshaw.

Ready for Production

A. E. Jukes, president of the Sheep Creek Gold Mines, Ltd., at Spokane, Wash., recently reported that the company's mine at Zincton, has completed underground development work recently preparatory to mining on the new 11th level. Drifting east and west on this level started in November, with December results reflecting better grade ore. He expects Paradise mine to continue operations throughout the winter.

To Explore Townsite

A corporation called the Hometown Mining Co. has been organized to prospect mineral veins under the townsite at Mullan, Idaho. The town is surrounded by big mining companies who are now either productively mining or preparing to develop mineral structures close by.

Juanita Shaft Reconditioned

An extensive development program is scheduled at the Juanita gold mine in the old Columbia district, 98 miles northwest of Winnemucca, Nev. Construction of camp buildings has begun and preparations completed for installation of a compressor plant. Underground work is planned at an early date. The property was developed by the Juanita Mining Co., through a 104-ft shaft and 615-ft tunnel. Control of the Juanita has been acquired by the Golden Century Industries of Salt Lake City.

Phosphate Rock in Butte Area

A large new phosphate plant is to be completed in the development of the Maiden Rock phosphate deposit in the Butte, Mont. area. Using hydroelectric power supplied by the Department of the Interior, the Victor Chemical Works will process into elemental phosphorus rock that has been considered too low grade for utilization. W. G. Sloan, retiring chairman of the Missouri Basin Field Committee, announced the construction of this big new plant for the chemical firm.

In full operation, the plant will employ almost 200, and average about 500 tons of phosphate rock daily.

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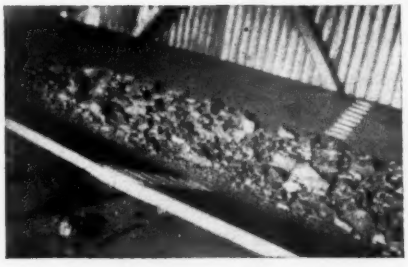

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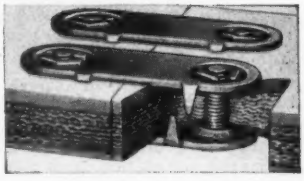

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Copper Production Soars

Nevada's copper production rose 43 percent during the last four months of 1950 and the output is higher than at any time since 1948. The gain was due chiefly to increased operations of Kennecott Copper Corp. and Consolidated Coppermines Corp. near Ely, Nev. The state is now third among copper producers, surpassed only by Arizona and Utah.

Numerous small copper producers are active in various areas of the state, and reopening of several properties has been encouraged by higher prices and urgent demand. Operations were resumed last summer at the Victoria mine north of Winnemucca, and Oregon interests are exploring and developing the Ramel property near Jungo and a few copper mines are active in the Mina, Yerington and other areas. Copper Canyon Mining Co., a lead-silver-zinc ore producer, is reported increasing production of copper ore from its properties in the Copper Canyon field south of Battle Mountain.

Discuss Alaska's Resources

The strategic mineral possibilities of Alaska have brought together recently members of the Alaska division of the Seattle Chamber of Commerce and the West Coast Mineral Association officers at Seattle, Wash., for consideration of new mineral projects. Ernest Patty, president of Alluvial Golds, conducted the detailed discussions on titanium, iron pyrites, mercury, tin, antimony, chrome, platinum and tungsten.

Charles J. Johnson of the Good News Bay Mining Co. in the Kuskokwin, described operations at the platinum property of this company, from which the crude metal is airmailed to the east coast for refining. George H. Waterman, chairman of the mining committee of the Seattle Chamber of Commerce, praised the U. S. Tin Corp. for its continued production at a time like the present. Tin possibilities of Deer Mountain in Alaska were discussed by Ralph Lomen of that region, while "Chuck" Herbert from the Seward Peninsula outlined the quicksilver deposits in the Northland.

A. Erickson, of the U. S. Bureau of Mines, who has been in the South Eastern section of Alaska for three years, is convinced that Alaska, the Yukon Territory, and the Cassiar area, can furnish sufficient ore to keep pace with the mounting demands.

W. A. Richardsen touched upon copper possibilities in the Latouche and Kennecott regions, warning, however, that about 6,000,000 tons of copper ore should be in sight before opening a property for long-time production.

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Address inquiries to the Editor. Include information on education, experience, marital and draft status and a recent photograph.

Start New Pit at Bisbee

About the first of April the Copper Queen Branch, Phelps Dodge Corp., had the first equipment at work on its new open-pit mine at Bisbee, Ariz. The first pit mining will begin in the area of the Johnson addition. The new pit will measure about four times the area of Sacramento Pit which covered 35 acres.

The deposit, known as the Bisbee East ore body is estimated to contain 41,000,000 tons of concentrating ore; 31,000,000 tons of material to be leached; and 7 million tons of waste which will have to be moved.

Equipment to be used will include five cu yd shovels and 25-ton trucks driven by 300 hp Diesel engines. Waste will be removed from the pit to No. 7 dump located west of Bakerville.

Preparatory work including the moving of houses, railroad tracks, the highway, and power lines is one of the biggest clearing projects ever attempted, according to Warren T. Smith, pit superintendent.

Seek Old Silver Veins

Officials of the Hamilton Development Co. have announced that the tunnel advancing at their property in the Hamilton silver district near Ely, Nev., is expected to enter the ore zone soon. The projected 500-ft tunnel has been driven above 170 ft into virgin ground believed to contain continuations of rich veins which produced silver in the 60's and 70's, when more than $50,000,000 was taken from the district.

N. M. Miners & Prospectors Meet

Members of the New Mexico Miners & Prospectors Association at their three-day annual convention, February 15-17, Hotel Hilton, Albuquerque, N. M., elected T. M. Cramer, vice-president of United States Potash Co., Carlsbad, their new president. He replaces W. H. Goodrich, general manager, Chino Mines Division, Kennecott Copper Corp. John A. Wood, Albuquerque, was elected first vice-president; T. A. Snedden, Vanadium, second vice-president and Jack Pierce was reelected executive secretary. Governor Edwin L. Mechem spoke to the miners, as did Samuel H. Williston, vice-president, Cordero Mining Co. and Sperry-Sun Well Survey Co., who announced his resignation from DMA. Among other speakers were: Otto G. Klein, regional director, General Services Administration; J. H. East, Bureau of Mines; George Argall, Jr., Editor of *Mining World;* D. L. Libbey, U. S. Potash Co.; Eugene Callaghan, director, N. M. State Bureau of Mines and Mineral Resources; Thomas L. Moore, Department of Commerce; Ward Ballmer, Chino Mines Division, Kennecott Copper Corp.

Thomas O. Evans, mining engineer for the A. T. & S. F. Railroad gave the first public evaluation of the uranium find at Grants, N. M., at the meeting and reported on exploration being done by the railroad on the property.

Keynote of the convention was Mining in National Defense and in a statement of policy fullest support of the association was pledged to that defense.

Lucky Friday Strikes Ore

Lucky Friday Silver-Lead Mining Co. at Mullan, Idaho, recently discovered a new vein of ore on the 1800-ft level 75 ft south of its productive Lucky Friday vein. The new vein shows two types of ore in a 3-ft wide fissure. One is a bright, coarse-cube galena with bright yellow bunches of chalcopyrite, the other streak is high-grade tetrahedrite. The company is presently producing 100 tons daily from the Lucky Friday vein.

To Unwater Harrington Mine

Plans to place the Harrington lead mine at Milford, Utah, back in operation have been announced by James D. Williams, general manager of Harrington Mines Co. The property has been closed since 1949. A subsidiary of Mt. Wheeler Mines, Inc., Pioche, Nev., Harrington Mines Co. has negotiated a 20-year lease on the Harrington and other Milford properties.

According to Williams, a 44,000 v. power line will be extended to the property. Upon completion of the line, the mine will be unwatered to the 600-ft level ,under an agreement with the owners, New Majestic Mining Co., which calls for at least 1200 ft of development work at this level. Work also will be done below the 700-ft level if exploratory activity proves the value of ores at that depth. The company has contracted for an initial expenditure of $60,000 in private capital and may ask for government assistance later. Ore will be shipped to the Bauer plant of Combined Metals Reduction Co.

Plan Chrome Smelter

Glendive, Mont., is to be the site of a $2,000,000 chrome smelter for the Chromium Mining and Smelting Corp., a U. S. subsidiary of the Canadian Iron Ore Co. The company will soon complete plans in Glendive to erect a plant employing over 200 men. The firm is negotiating for an option on the Benbow Chrome Mine near Columbus, Mont., to supply ore. However, chief sources for the ore will be Spokane stockpiles of imported ores. Local capital is to sponsor the erection of about 200 housing units for smelter workers. The new plant was made possible in Montana because of favorable freight rates and low-cost power.

Manganese Research Project

Washington State College, which maintains a large mining department with a faculty of experts at Pullman, Wash., has just launched at its new mining experiment station, a top-priority research project in manganese under the direction of Dr. R. L. Albrook, division director. This new project is being undertaken in connection with the Bonneville Power Administration.

Gold Hunter Changes Hands

Day Mines, Inc., has purchased the Gold Hunter mine at Mullan, Idaho. The company's primary object is a deep tunnel outlet for the King group of mining claims and consolidation of a block of patented claims extending from Burke to the Snowstorm mine east of Mullan and north of the Hunter mine about two miles. The lower Hunter tunnel extends north a distance of 5000 ft, and an estimated extension of 10,000 ft would give an approximate depth of 3000 ft in the King group.

The Independence Lead Mines, a group of mining claims lying between the Hunter and Morning mines, are also involved in the deal. The Federal Mining & Smelting Co. is reported to be interested in this part of the transaction. Federal has the ore zone, in which the Morning and Hunter are located, opened up to a depth of 5000 ft, while Hunter has it opened only to the 1200-ft level.

The Hunter mine was discovered about 1885 by Hunter & Moore, contractors, building a government trail from Mullan to Thompson Falls, Mont. The property consists of 11 patented mining claims, three patented mill sites and the Hunter ranch of 160 acres. The mine, a mineralized shear zone 300 ft wide of silver-lead ore content, has been in almost continuous operation since its discovery. At present it is equipped with a 300-ton concentrating mill and complete surface equipment.

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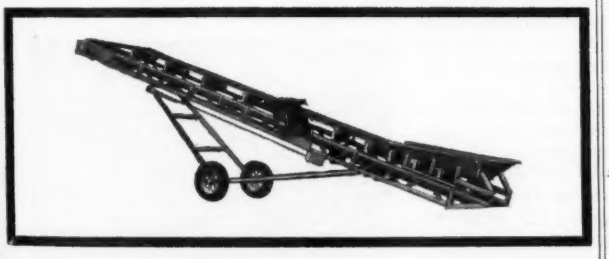

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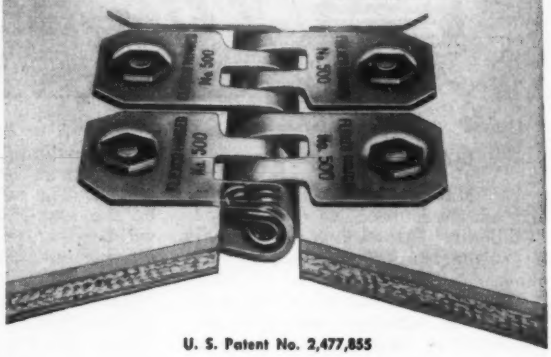

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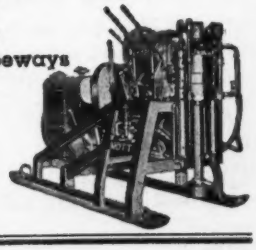

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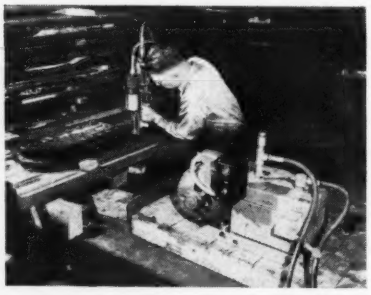
Manufacturers Forum

Hydraulic Rivet Squeezer

The Manco Mfg. Co. of Bradley, Ill. has announced a new portable "Guillotine" for use in riveting liners on cutter bars of coal cutting machines.

The unit consists of a relatively light rivet squeezer head (38 lbs) connected by high-pressure hoses to a semi-portable pump powered by a 2 hp electric motor. The operator



merely presses a valve handle causing the power ram to deliver 60,000 lbs thrust against the rivet head. Release of the valve automatically retracts the ram. Entire riveting cycle requires only three seconds, according to the manufacturer, and the rivet is said to be squeezed flush.

The Guillotine, it is stated, has been carefully engineered for minimum maintenance, and especially developed oil seals prevent leakage at no pressure and at maximum pressure—10,000 psi. With a hand-operated pump it is completely portable, and can be used for replacing rivets on coal cutting machines underground.

The unit is now being adapted to trimming the ends of roof bolts flush to the nut.

Largest Self-Unloader Bulk Carrier Powered by GE Drive

Propulsion and conveyor equipment for the largest self-unloader ore carrier on the Great Lakes will be supplied by General Electric to the Bradley Transportation Co., Roger City, Mich.

Designed to unload 5000 tons of limestone an hour, the conveyor system will utilize two 200-hp hold conveyor motors, two 200-hp elevator motors and two 250-hp boom conveyor motors. The unloading thus achieved by the higher rating of the motors will be greater than on any other self-unloader now in service.

The propulsion equipment will include one 7000 cross compound, double reduction turbine gear set. The design steam conditions will be 450 psig, 750° F with exhaust to 28.5 in Hg vacuum.

105-ft Portable Air Compressor

An improved 105-ft portable air compressor has been announced by Worthington Pump and Machinery Corp. The new compressor is said to be lighter, lower and more maneuverable. It is built around the standard Worthington Blue Brute compressor and is powered by either Diesel or gasoline engine.

New features and advantages claimed by the manufacturer include: a new zero pressure retractable third wheel; new underslung spring mounted undercarriage with hevay duty commercial 15-in. trailer tires; a simple retractable support leg; a new style unit core radiator with pressure cap to prevent boiling and better operation of engine at higher temperatures and altitudes; a new carburetor with fixed jets for better economy; and relocation of instrument panel and battery box to give unrestricted full length tool boxes.

The redesigned 105-ft Worthington Blue Brute compressor is 10 ft shorter, 4 in. lower and weighs 300 lb less than previous models. For further information please write Construction Equipment Division of the company at Holyoke, Mass.

Prolonged Life for Rubber

The performance life of all rubber parts and surfaces which have hardened, cracked and become inelastic with age can be greatly prolonged by a unique rubber plasticizer now being made available to industry by Schwartz Chemical Co., Inc., 326 West 70th St., New York 23.

When applied by cloth or brush to an old rubber surface, it is said to actually plasticize the rubber and to impart the feel, grip, resilience and performance of new rubber.

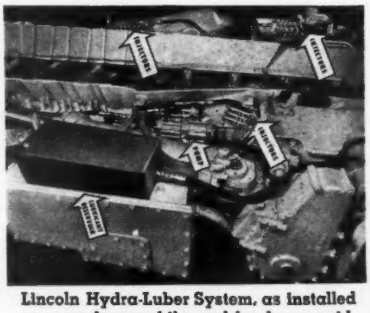
The product is described as a non-inflammable and non-volatile liquid. Company chemists state that, because it does not evaporate but is absorbed by the rubber, one application results in a lasting improvement.

Called "Rub-R-Vive," the plasticizer is of potential interest to office managers and plant superintendents who face the acute problem of conserving and lengthening the life of rubber products now in use in office and factory. This is particularly true, reports the manufacturer, because of the increasing importance of rubber to the defense effort and the rigid controls recently clamped down on this highly critical material by the National Production Authority.

Available in pint, quart and gallon cans, "Rub-R-Vive" is said to have excellent shelf life and its storage does not require a fire department permit. Production is being increased in anticipation of a widespread demand resulting from the tight rubber situation.

Automatic Centralized Lubrication

Lincoln Engineering Co., St. Louis, has announced a new improved Centralized Lubrication System for application to all mining machinery which utilizes a hydraulic pressure system



Lincoln Hydra-Luber System, as installed on a modern mobile coal loader, providing automatic lubrication to 68 bearings

for controlling and operating various movements of the machine, such as raising, lowering or swinging ramps, conveyors and scrapper blades.

Each bearing is connected to a lubricant injector adjustable externally to supply the exact amount of oil or

grease required. The circuit of injector manifolds is connected by flexible hose to the main supply line terminating at the hydra-luber pump. This is supplied with lubricant from an independent reservoir and connected by flexible tubing to the hydraulic valve controlling movement of machine.

This equipment will be on display in Lincoln's Booth No. 2614 at the American Mining Congress Show, at Cleveland, May 14-17. For complete details write for Bulletin 670, Lincoln Engineering Co., Industrial Division, 5701 Natural Bridge Avenue, St. Louis 20, Mo.

SO_2 Production from Pyrite

Applicability of the Dorrco Fluo-Solids System to the roasting of iron pyrite or zinc or copper sulphides for the production of SO_2 gas has been announced by The Dorr Co. engineers, of Stamford, Conn. Producers of sulphuric acid and users of sulphur dioxide faced with curtailment of sulphur supplies, will find this method of tapping an alternate source of SO_2 of great interest.

Either pyrite or pyrrhotite as flotation concentrate without further grinding, or massive pyrite or pyrrhotite crushed to pass approximately 14 mesh, may be self-roasted by Fluo-Solids. There are no moving parts within a FS Reactor and the manufacturer claims lower investment and operating costs than with conventional roasting methods.

Unusual Motors for Continuous Mining

New types of electric motors to drive the powerful continuous mining machines in use today, have been developed by Westinghouse Electric Corp., East Pittsburgh, Pa. Externally they look like nothing but a rectangular steel box, sometimes with ribs on two sides. Only a shaft protruding from one end suggests what might be inside. The big problem, the company says, is lack of space. Designers of continuous mining machines need high power outputs packed into unbelievably small space. Furthermore, the motor must be explosion resisting.

Two varieties are being built; one is air-cooled, the other water-cooled. A common air-cooled motor has corrugated sides to facilitate heat dissipation. In a rectangular case 18 by 24 by 34 in. is packed 54 hp. Silicone insulation is used on the motor windings.

The water-cooled unit is similar, but 60 hp is obtainable in less volume. This motor has a built-in heat exchanger of finned copper tubes through which water passes on its way to the face for wetting down the coal.

Materials Handling Loader

A new wheel tractor loader featuring a hydraulic torque converter drive and an entirely new design clutch-type transmission is now manufactured by Tractomotive Corp., Deerfield, Ill. It is called the TL-10 Tracto-Loader.

According to the manufacturer, the single stage torque converter furnishes a smooth, constant flow of power to the drive wheels. Loading in a higher gear is possible, operation is easier and there is less wear and tear on clutches and other parts.

The new clutch-type transmission eliminates most gear shifting. Two multiple disc clutches are built into the transmission. One is for forward speeds, the other for reverse. The operator can go forward or reverse by simply pushing or pulling one lever. His reverse speed is almost twice as fast as forward. There are four forward and four reverse speeds.

The TL-10 is mounted on rubber tires, has a ¾-cu yd, hydraulically controlled bucket and weighs 10,650 lb. Power is furnished by an Allis-Chalmers 40.5 brake hp gasoline engine.

As in other Tracto-Loaders, the bucket is over the drive wheels rather than the steering wheels. This provides positive traction and exceptional maneuverability.

The Tracto-Loader is sold exclusively through Allis-Chalmers Industrial tractor dealers. More information may be obtained from a dealer or by writing to the company.

— *Announcements* —

Southwest Machinery Co., Oklahoma City, Okla., has been appointed a distributor for general purpose excavators and Hydrocranes by **Bucyrus-Erie Co.**

Ralph J. Cordiner has been elected president of the **General Electric Co.** to succeed **Charles E. Wilson**, recently appointed chairman of the new Defense Mobilization Board. Mr. Cordiner previously was executive vice-president and a director of the company.

Ralph K. Gottshall, assistant general manager of the explosives department, was appointed assistant to the president, **Atlas Powder Co.**, Wilmington, Del., by President Isaac Fogg. Mr. Gottshall will be assigned to general administrative duties in the general office at Wilmington.

D. J. C. Copps, formerly manager of the Joplin district sales office and recently on special assignment in the explosives department, was appointed assistant general manager.

The Electric Railway Improvement Co. has recently changed its name to Erico Products, Inc.

John P. Courtright, vice-president in charge of sales and service, Marion Power Shovel Co., was recently elected to the board of directors of the company. Mr. Courtright is also president of the Power Crane and Shovel Association.

Announcement has been made of the organization of **Machinery, Inc.**, located at 919 Virginia Street, E., Charleston, W. Va. This new company will specialize in the sale and service of heavy construction equipment and supplies and will cater to the needs of contractors, miners, timbermen and others in the construction-industrial field. Officers are **O. W. Robinson**, president; **W. T. Coleman**, vice president and general manager; and **C. K. Payne**, secretary and treasurer.

Reich Bros. Mfg. Co., Terre Haute, Ind., has appointed **Mobile Drilling Co.**, Indianapolis, as sales representative for their line of truck-mounted rotary drilling equipment.

Earl D. Stearns, former general sales manager, **Barber-Green Co.**, Aurora, Ill., has been transferred to the post of manager of the conveyor division. **Walter B. Holder** succeeds Stearns as general sales manager.

H. F. Hagenauer was recently named purchasing agent of **Ahlberg Bearing Co.** to succeed P. F. McGuinn, deceased.

Kenneth Benson has been appointed district manager of the mining fields in the Pittsburgh area for Ohio Brass Co. Mr. Benson will serve the territory formerly covered by the late Richard Goss and will have his headquarters in Pittsburgh.

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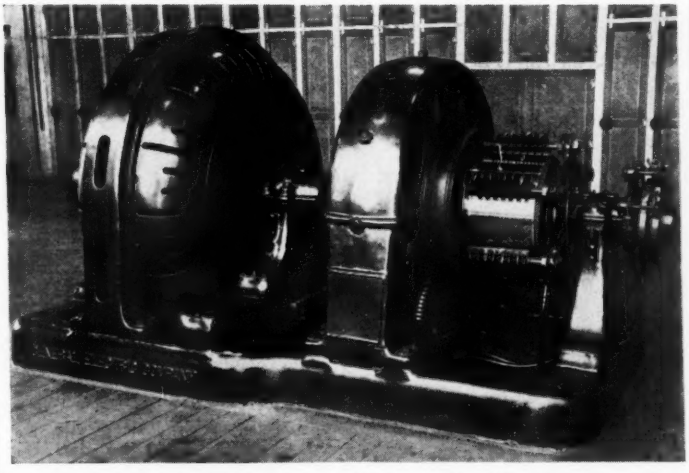

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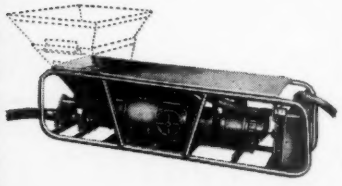

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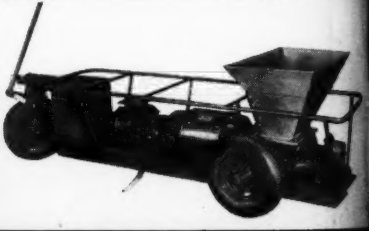

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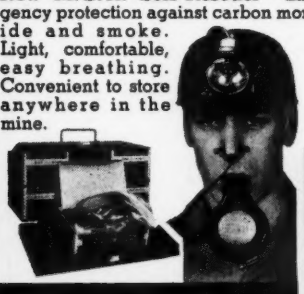

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